OBSERVATIONS

ON THE

STRUCTURE, ŒCONOMY, AND DISEASES

OF THE

FOOT OF THE HORSE.

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OBSERVATIONS

ON THE

STRUCTURE, ŒCONOMY, AND DISEASES

OF THE

FOOT OF THE HORSE,

AND

ON THE PRINCIPLES AND PRACTICE

OF

SHOEING.

BY EDWARD COLEMAN,

PROFESSOR OF THE VETERINARY COLLEGE, PRINCIPAL VETERINARY SURGEON TO THE BRITISH CAVALRY, AND TO HIS MAJESTY'S MOST HONORABLE BOARD OF ORDNANCE, AND HONORARY MEMBER OF THE BOARD OF AGRICULTURE.

VOL. I.

Homo, naturæ minister et interpres tantum facit et intelligit, quantum de naturæ ordine, re vel mente observaverit; nec amplius scit aut potest. BACON. NOV. ORGAN.

——Homini quippe, in naturam nullius rei protestatem esse, præterquam motus, ut scilicet corpora naturalia aut admoveat aut amoveat. DE AUG. SCIENT.

London:

PRINTED FOR THE AUTHOR;

AND SOLD AT THE VETERINARY COLLEGE; AT THE FORGES, IN GROSVENOR MEWS, BOND STREET, AND CURTAIN ROAD, FINSBURY SQUARE; ALSO BY J. JOHNSON, ST. PAUL'S CHURCH YARD; C. DILLY, POULTRY; AND J. COX, BOROUGH.

1798.

TO

THE KING.

SIRE,

I BEG permiſſion to lay before your Majeſty the firſt fruits of my labors in the Veterinary College; an Inſtitution which your Majeſty has condeſcended to patronize with ſo much goodneſs, and ſo great effect. By conferring on the Veterinary Surgeons, employed in the Cavalry, the rank of commiſſioned Officers, your Majeſty has done more to

promote

promote the Veterinary Art, than otherwise could have been effected in centuries.

This single act has not only raised the Art from contempt to respectability, but already induced many medical Students, of liberal education, to devote their services to its improvement. Whatever may be thought of my very limited endeavors, permit me, Sire, to say, that your Majesty's distinguished attention to the progress and cultivation of knowledge in general, has in no one instance been more happily employed than the present; since the noblest and most valuable

luable arts, are thoſe which embrace the wideſt ſphere of benevolence: utility to Mankind, mercy and relief to the Brute Creation.

I have the honor to be
Your Majeſty's
faithful ſubject and ſervant,

EDWARD COLEMAN.

VETERINARY COLLEGE,
May 1, 1798.

INTRODUCTION.

HAVING had the honor of being Profeſſor in the Veterinary College more than four years, it has very naturally been expected by many of the Subſcribers, that I ſhould give them, and the Public, the ſatisfaction of knowing if any ſolid advantages have been derived from this Inſtitution; that I ſhould declare and explain, for the public good, whatever diſcoveries may have been made in the Veterinary Art, hitherto ſo miſerably neglected; or at leaſt ſhew that a proper foundation has been laid for future improvements.

As, in this country, every branch of this Art is at preſent in a ſtate of very great imperfection, my original intention was to have attempted a Syſtem of Anatomy and Phyſiology of the Horſe, with ſome obſervations in Pathology; which, though an arduous taſk, I am not without hopes of yet being able to accompliſh. But, as to compleat a work of this nature would require a life-time employed with induſtry and ſucceſs, I have determined to publiſh, occaſionally, my obſervations on the moſt eſſential parts of the Veterinary Art. I have preferred this plan, under the conviction that few men have either time or inclination to read a great profeſſional book. Beſides, by the ſelection of objects that are important, I ſhall diſcharge the duty I owe to the Public in general, and to the Subſcribers of the Veterinary College in particular.

I am

The Art I profeſs to teach, I am well aware, is ſtill in its infancy; that many opinions, formerly cheriſhed, are now given up; and that many of our preſent conjectures will probably ſhare the ſame fate. This muſt ever be expected in extenſive enquiries into a new and complicated Art; but, I truſt, I ſhall always be careful to ſeparate opinions founded on hypotheſes, from facts eſtabliſhed by experience.

Well grounded principles are eſſentially neceſſary to improve and govern the practice of every art and ſcience, for without theſe, the ſucceſs of our operations muſt ever remain doubtful.

The practice of ſhoeing Horſes does not appear to have undergone any material alteration in this country for centuries; yet it will not be doubted, I believe, but that this art is ſuſceptible of great improvement.

provement. Thofe who have been employed to fhoe Horfes, and attend to their difeafes, have never acted upon principles of any fort: nor could it be expected that men, totally deftitute of all knowledge of the formation of the Horfe's foot, and the ufes of the different parts, fhould be able to cut the hoof, and apply a fhoe, without deftroying, or in fome degree perverting, the intentions of nature. Ignorant of chemiftry and the properties of medicine, unacquainted with the ftructure and œconomy of the animal, it was impoffible for them to adopt any rational fyftem: and without fyftem it was not likely that the practice could ever be much improved. With greater probability of fuccefs might we employ an ignorant mechanic to fupply the defects of a watch, who had never examined the fituation and ufe of the wheels and the fpring, or any part of its ftructure. We could not expect much advantage

from

from the labors of ſuch a man; and yet his employment would be leſs intricate and difficult than that of a Farrier, who has to keep in health, or remove the diſeaſes of a complicated machine, the internal parts of which he has probably never once ſeen. The artiſt who attends to the clock or watch, or any inanimate machine, begins to learn his art ſcientifically and properly. He takes the machine to pieces; he ſees all the parts that enter into its compoſition; he learns the ſituation and uſes of theſe parts, and the relative importance of each, before he attempts to remove a ſingle impediment or defect. But the Smith is required to preſerve various parts of the Horſe's foot in health that he never ſaw, and reſtore them, when diſeaſed, to their original condition, without being acquainted with their anatomy or functions.

No doubt many men of great natural talents have devoted much of their time and labor to this pursuit: but without Anatomy to teach them the formation of the foot; and without Phyſiology to indicate the uſes of the parts; their principles, if they poſſeſſed any, muſt be fallacious or doubtful, and the ſucceſs of their practice uncertain.

As no improvements have been, or were likely to be made by men laboring under theſe diſadvantages, it muſt be a matter of great exultation to the original founders and ſupporters of the Veterinary College to be informed, that upwards of eighty Pupils have been made acquainted with proper principles, calculated to improve the practice. They have ſeen the parts of which the Horſe is formed; they have been taught the functions of theſe parts; they have attended to the different diſeaſes

incident

incident to Horſes, and the remedies employed. Where theſe have not proved ſucceſsful, the animals have been opened after death, and the diſeaſed parts examined. We have in this manner been able to demonſtrate, that the opinions formed of the diſeaſes were juſtly or erroneouſly founded, that we could or could not have done more to preſerve the life of the animal.

The Veterinary Pupils have been inſtructed by a very celebrated Phyſician, Dr. *Fordyce*, in the Materia Medica, Chemiſtry, and the practice of Phyſic. And they have heard Lectures on Human Anatomy and Phyſiology, and on the principles and practice of Surgery, by Dr. *Baillie*, Meſſrs. *Cruickſhank*, *Home*, *Cooper*, and *Wilſon*. The profeſſional knowledge, of theſe Gentlemen is univerſally admitted, and above my praiſe. But I think it a duty to acknowledge

their

their liberality in giving their aſſiſtance and inſtructions to the Veterinary Pupils, without fee or reward. I ought not here to forget the debt which we owe to the memory of the late celebrated *John Hunter*, one of the firſt and beſt friends to this Inſtitution: neither will I neglect to acknowledge the numerous advantages I have derived from the inſtructions of my particular friend, Mr. *Cline*; to whom I am indebted not only for any attainments I may have made in the ſtudy of Human Anatomy, but alſo for having directed my attention, and given me much information, on my preſent ſubject.

The improvements that can be made by any individual, muſt be trifling, and not worthy of national ſupport. But the accumulated talents and induſtry of all the Veterinary Surgeons, directed to one object,

ject, muſt ultimately be attended with great and manifold diſcoveries.

The public have already derived ſome advantage from the Veterinary College, in return for the liberal grants that have been made by Parliament. Moſt of the regiments of regular Cavalry in England have been ſupplied with Veterinary Surgeons; and I believe that there is no regiment in his Majeſty's ſervice, which has had an opportunity of ſeeing the Veterinary Practice, oppoſed to the former ſyſtem, that would not feel a pleaſure in bearing teſtimony to the advantages which Government has already derived from their appointment.

The Horſes of his Majeſty's moſt honorable Board of Ordnance have been ſhod very ſucceſsfully for two years on the plan employed in the College; and

the greater part of the Britiſh Cavalry are now ſhod in the ſame manner.

A proper mode of ſhoeing is certainly of more importance than the treatment of any diſeaſe, or perhaps of all the diſeaſes incident to Horſes. The foot is a part that we are particularly required to preſerve in health; and if this art be judiciouſly employed, the foot will not be more liable to diſeaſe than any other organ. But if the principles of Shoeing are not well underſtood, then the practice becomes pernicious; then, inſtead of preventing, we are creating diſeaſes. Now as all Horſes employed require to be conſtantly ſhod, ſo all Horſes are liable to be diſeaſed, if the principles and practice of ſhoeing are erroneous; and when diſeaſe takes place, lameneſs is a frequent conſequence.

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If, therefore, it be a fact that the common practice of ſhoeing engenders diſeaſes, while the practice here recommended preſerves Horſes' feet in their natural ſtate; then it will be admitted, that great benefits reſult to the public from its general adoption. And that the practice may be faithfully executed in the Army, a Farrier from each regiment of Cavalry has been permitted to attend the College, to learn the practical part of ſhoeing. This plan was thought neceſſary, to remove the prejudices of the Farriers, and to prevent their oppoſition to the principles of ſhoeing recommended at the College, and adopted by the Army Veterinary Surgeons.

It is notorious that the common practice of ſhoeing produces corns, contracted feet, and many other diſeaſes; and it is a fact now aſcertained, that theſe diſeaſes may be prevented.

The intention of this Publication is to make the principles and practice of the Veterinary College more generally known. Some Gentlemen from novelty, ſome from partial information, and others from conviction of its utility, have employed horſe-ſhoes very ſimilar to thoſe uſed at the College. But to the compleat ſucceſs of the ſyſtem, it is neceſſary that cloſe attention be paid to two circumſtances. It is not only requiſite that the ſhoe ſhould be accurately made, but the foot muſt be cut and prepared very differently from the common mode. Whatever ſhoe be employed, if parts that are eſſential to the œconomy of the foot are not preſerved; and if the uſeleſs parts that require removal be allowed to remain, the foot muſt ſoon be in a morbid ſtate. Where the hoof is cut improperly, the ſhoe muſt fail of ſucceſs; not perhaps from any fault in the conſtruction of the ſhoe, but from its application.

Nevertheleſs

Neverthelefs it will not be found to require more mechanical dexterity to cut the hoof properly than improperly; and the beft form of fhoes is made with as little labor as a common fhoe.

It is not my intention, in this Volume, to defcribe the internal anatomy or the difeafes of the Horfe's foot; this fubject will be confidered hereafter: but it will be abfolutely neceffary to confider the ftructure and œconomy of the hoof, before any rational fyftem of fhoeing can be adopted; and as one great object of the prefent Work is to explain the beft method of preferving the hoofs of Horfes by fhoeing, we fhall direct our obfervations to thofe points that are effentially neceffary to elucidate the practice.

It would have been more confiftent with the rules of anatomical demonftration, to have firft defcribed

the bones, the muſcles, and the whole internal ſtructure of the foot, before we examined the external covering, viz. the hoof: but as moſt of my readers are probably not acquainted with the internal mechaniſm of the Horſe's foot, it ſeems better to begin with an explanation of the ſtructure and functions of thoſe parts that can be learnt with facility.

The names and ſituation of the cruſt or wall, the ſole, the frog, and bars, are practically known to almoſt every gentleman who keeps a Horſe. The formation and uſes of thoſe parts will therefore be eaſily underſtood; and when the functions of the hoof are well known, great advantages will be derived from a deſcription of the contents; and the mind is naturally led on to a more minute inveſtigation of the ſubject. But to deſcribe in the firſt

inſtance

inſtance the Anatomy and Phyſiology of parts that have not been ſeen, would be very apt to miſlead, without giving any ſolid or uſeful information. We ſhall therefore reverſe the common order of anatomical deſcription, and begin with the ſtructure and œconomy of the hoof. We ſhall then endeavour to prove that the common practice of ſhoeing alters the natural form of the hoof, and produces in it a variety of defects, while the practice here recommended preſerves its ſtructure and uſes unimpaired by ſhoeing. This ſubject will form the firſt Volume.

The natural hoof, and the art neceſſary to be adopted for its preſervation being conſidered, we ſhall then proceed to inveſtigate the internal formation and œconomy of the foot. And as this organ is very complicated, it will be neceſſary to introduce a conſiderable number of Plates, to give any juſt

conception

conception of its formation. We ſhall then deſcribe the different diſeaſes incident to the Hoof and Foot, and ſuggeſt the remedies neceſſary to be employed for their removal.

OBSERVATIONS,

OBSERVATIONS,

&c. &c. &c.

SECTION I.

The natural Form, Structure and Œconomy of the Horſe's Hoof.

BEFORE we conſider the beſt practical mode of preſerving the feet of Horſes by ſhoeing, it will be neceſſary to deſcribe the external form, the ſtructure, and the œconomy of the hoof. Without a knowledge of the different parts of the natural hoof, we ſhall be liable to miſtake diſeaſe for health, and health for diſeaſe.

To aſcertain the figure and proportions of the well-formed foot, there is no more neceſſary than to examine the hoofs of Horſes, where no ſhoes or art of any kind has been employed. We ſhall then find, that the hoofs of the fore feet are as wide from heel to heel as they are long; that is, the bottom of the hoof approaches to a circle. *(See Plate I. figure the 1ſt, of a Natural Hoof.)* This fact has been ſo little attended to, that moſt writers have given plates and deſcriptions of diſeaſed and contracted feet, when they intended to have deſcribed a natural foot.

The common practice of ſhoeing has been ſo univerſally deſtructive, that unleſs the hoof be examined before it comes to the hands of the Farrier, there is no probability that it ſhould ever be ſeen in its original perfect figure. From this important circumſtance being overlooked, Authors have had vari-

ous opinions reſpecting good and ill formed feet; for all of them appear to have made their obſervations on Horſes' hoofs that had been repeatedly ſhod, without attempting to eſtabliſh any rule or principle from nature. That rule or principle is the original form of the Horſe's foot before it has been altered or perverted by art; for no doubt every animal, as well as every part of an animal, has a certain and determined ſtructure and function, when in health, from which there can be no deviation without producing defects.

The foot of a Chineſe woman, diſtorted and cramped by a tight ſhoe, would certainly not be ſelected by the Anatomiſt or Philoſopher to illuſtrate the natural form of the human foot: nor can any form of hoof, different from the original, be otherwiſe than deſtructive to the uſes of an animal

deftined to fupport a great weight, and undergo much labor.

Thofe that are in the habit of examining the formation and œconomy of animals, as they advance in knowledge, are more and more convinced, that every part is made with infinite wifdom and contrivance; that each part has its particular ufe; and that had it been made otherwife, the purpofes for which it was intended could not have been anfwered.'

We fhould have no difficulty in demonftrating that a circular foot, as it comes from the hands of the Maker, is the beft poffible form for the Horfe. No one can doubt but that a foot of this defcription is better adapted to fupport a great weight, than a fharp, oblong, contracted foot, which finks deep into the ground at every ftep, and fatigues the animal.

It

It is alſo true, that, in proportion as the hoof is long at the toe, the Horſe is liable to trip. Theſe are the obvious inconveniences of a long contracted hoof; but as the natural hoof is created circular, any deviation from this figure produces an equal alteration of the parts contained within. The contents of the hoof are as tender as the quick or ſenſible parts under the nail; and can no more endure preſſure without pain and inconvenience, than the human foot can bear the continuance of ſmall tight ſhoes.

The cavity of the hoof is always completely filled by the foot, ſo that the natural hoof is perfectly equal to contain the foot, without the leaſt preſſure, but not one hair's breadth larger or ſmaller. No ſhoe can poſſibly be fitted with ſuch mathematical exactneſs to the human foot, as the hoof is to that

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of the Horſe. But as the cavity of our ſhoes cannot be diminiſhed without pain, ſo the hoof of the Horſe cannot be altered in its form, without a preſſure, equally painful, on the foot, and which, with equal certainty, tends to produce diſeaſe. When the human foot is pinched by too ſmall a ſhoe, the pain is naturally removed by the ſubſtitution of a larger one; but the conſtant ſhoeing of Horſes in the common way, gradually increaſes the contraction, and the animal is forced to perform great labor with a hoof that is every day producing more and more preſſure on the foot.

Whatever be the ſtructure and form of the natural hoof, I preſume it will be admitted, that the ſole object of ſhoeing is to preſerve the hoof in the ſame ſtate. No art can improve the original circular foot Nature has made; and that practice muſt be

pernicious

pernicious and highly abſurd which alters it. To aſcertain whether this principle has been attended to in practice, and the foot preſerved in health, we have no more to do than examine the hoofs of Horſes that have been repeatedly ſhod. It will then be obſerved that nearly in proportion to the repetition of ſhoeing, the foot deviates from a circle, and becomes oblong. Indeed many feet, from this cauſe, are not one third, and ſome not even one fourth as wide as long. *(See Plate I. figure the 2d.)* Age, however, has no effect in changing the form; for we can not only preſerve Horſes' feet in their natural condition, but when contracted reſtore them to their original figure. Neverthleſs, in proportion as the common practice of ſhoeing has been repeated, the heels will generally be more or leſs contracted. An old Horſe that has been ſhod may, therefore, be diſtinguiſhed from a young one by the

feet

feet only. This contraction, which usually terminates in lameness, is not the only effect of improper shoeing; for thrushes and corns are generally produced by the same cause. It is, therefore, of great importance to ascertain the practice that occasions such effects, and the means best adapted to prevent them. But previously to this enquiry, it is necessary to describe the formation, and functions, of the crust, sole, frog, and bars.

The whole of the hoof is composed of horny fibres, without the smallest degree of sensation. The crust or wall surrounds the anterior and lateral parts of the foot. It grows obliquely from the coronet downwards, and increases in width as it descends. *(See Plate II. figure the 1st.)* The crust is the only part that can receive nails without mischief, is thicker at the toe than quarters, *(see Plate II. figure*

the

the 1*ſt.)* and generally thicker at the outer than at the inner quarter. It is ſmooth and convex on the outſide, but laminated and concave within, *(ſee Plate II. figure the* 1*ſt. and Plate IV. figure the* 1*ſt.)* for the purpoſe of being united with correſponding laminæ covering the loweſt bone of the foot, called the coffin bone. This union of the cruſt with the coffin bone, ſuſtains the weight of the animal. The Horſe is not ſupported by the ſole or frog; for, if theſe parts be removed or diſeaſed, ſo as to become ſoft and of a fungous ſtructure, and incapable of reſiſtance, as in canker, the cruſt is, nevertheleſs, capable of bearing the whole of the ſuperincumbent weight. If the ſole and frog, in reality, ſupported the weight, then the foot would ſlip through the cruſt, when the frog and ſole were taken away. But, as the cruſt ſupports the weight, even when the ſole and frog are removed, there can be no

doubt but that one of the functions of the cruft is to fupport the animal. And, as the laminæ are elaftic, this furnifhes as many elaftic fprings as there are laminæ, to prevent fhake and concuffion when the Horfe is in action. The horny fole is united with the lower part of the cruft, *(fee Plate II. figure the 1ft.)* and covers the inferior furface of the coffin bone: but between the horny fole and coffin bone there is a vafcular fubftance, called the fenfible or feeling fole*, and the blood veffels of this part produce the horny fole. The horny fole is concave on the outfide, *(fee Plate I. figure the 1ft.)* beginning at the junction with the cruft, and increafing as it advances towards the centre; fo that the edge of the fole, united to the cruft, is leaft concave. The fole, on its internal furface, is convex. *(See Plate II. figure the 1ft.)*

* This part of the foot will be hereafter defcribed.

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The uſe of the horny ſole is to protect the ſenſible ſole from injury, to act as a ſtop, by embracing the ground, and when the laminated ſubſtances elongate, the horny ſole at the heels deſcends. This action of the horny ſole contributes very conſiderably to aſſiſt the laminæ in preventing concuſſion when the Horſe is in motion.

The bars, or binders, as they are termed, are two in number. They are placed between the frog and ſole; and, at the heels, form a broad ſolid junction with the cruſt. *(See Plate I. figure the 1ſt.)* The toe, or ſmall part of the bar, ſometimes reaches externally nearly as far as the toe of the frog. The bars within the hoof are laminated in the ſame manner as the internal part of the cruſt, and are attached to the horny ſole. *(See Plate II. and*

Plate IV.) The infenfible laminæ are intimately connected with the laminæ of the fenfible fole.

The ufe of the external bars is to keep the heels expanded; and the internal laminæ of the bars are intended to prevent diflocation, or feparation of the fenfible fole, from the horny fole. In a natural hoof there are two large cavities between the frog and bars. *(See Plate I. figure the 1ft.)*

The frog is an infenfible body, externally convex, and placed in the centre of the fole, of a wedge-like form, pointed towards the toe, but expanded as it advances to the heels. In the centre of the broad part there is a fiffure, or feparation. *(See Plate I. figure the 1ft.)* The frog is connected internally with another frog, of a fimilar figure, but different

in

in ſtructure. The external frog is compoſed of ſoft elaſtic horn, and totally inſenſible. The internal frog is much more elaſtic than the horny frog; it has ſenſation, is connected above with a ſmall moveable bone, (by ſome called the ſhuttle bone) and at the extremity of the heels with two elaſtic ſubſtances called cartilages. The toe of the ſenſible frog is united to the coffin bone; but more than nine tenths of both frogs are behind the coffin bone. The toe of the ſenſible and horny frogs, from their connection with the coffin bone, are fixed points, and have no motion; but the heels of the frogs, being placed poſterior to the coffin bone, and in contact with moveable, elaſtic (and not fixed or reſiſting) ſubſtances, a very conſiderable lever is formed, and whenever the hoof comes in contact with the ground, the frog firſt aſcends, and

then

then defcends*. The afcent of the frog expands the cartilages, preferves the heels from contraction, and affords to the Horfe an elaftic fpring: while its wedge-like form prevents the animal from flipping whenever it embraces the ground. But, without any anatomical enquiry into its internal ftructure and connection with other parts, the fhape and convexity of the frog clearly demonftrate that it was formed to come in contact with the ground. *(See Plate I. figure the 1ft.)*

We cannot fuppofe that the all-wife Creator would have made an organ, much expofed to in-

* The attachment of the fenfible frog to the fhuttle bone and cartilages, will be defcribed more fully hereafter, and Plates given to fhew their connection, and explain their functions. But it was neceffary to mention them briefly in this place, that the ufe of the horny frog might be the better underftood.

jury,

jury, without making its ſtructure adequate to its function. We ſee that animals deſtined for a cold climate are provided with a much warmer covering than animals in a higher temperature: we diſcover that the eye is admirably conſtructed for receiving light; the ear for the vibrations of ſound; and every organ, in every animal, beautifully formed to anſwer its peculiar uſe. Shall we then doubt that the frog is made with the ſame degree of wiſdom as other organs? Shall we not conclude that it was intended to receive preſſure, ſince its convexity muſt make it liable to touch the ground at every ſtep? The more we inveſtigate this ſubject, the more we are convinced that the uſe of the frog is to prevent the Horſe from ſlipping, to preſerve the heels expanded, and by its motion to act as an elaſtic ſpring to the animal.

Mr. *Saintbel*, and many others, were of opinion, that the ufe of the frog, is, to ferve as a cufhion, or guard to the tendon of the flexor mufcle of the foot. Where this opinion prevails, it is very natural to conclude, that art fhould endeavor to raife the frog from the ground, by a thick heeled fhoe, in order to guard the tendon from bruifes. But, if it be a truth that this projecting body was intended to enter the ground, then it will follow, as a law of nature, *that unlefs the frog perform its functions, it muft be difeafed.*

The human legs are formed to fupport the weight of the body; but if they are conftantly kept in a horizontal pofture in a ftate of reft, they will foon become enfeebled and difeafed. The Horfe is an animal intended for active life, but if he is fuffered to remain long without motion, his whole fyftem

becomes

becomes affected. Indeed, common obſervation clearly proves, that no animal, or any part of an animal, can be preſerved in health, where the natural functions are perverted. If the real functions of the frog had been equally well underſtood, then it would have been thought as neceſſary, for the health of this organ, that it ſhould be in contact with the ground, as we know it to be important for an active animal to have motion.

That the frog was not made to defend the tendon, can be demonſtrated. There is no medical man, in the leaſt acquainted with the ſtructure and œconomy of tendons, but muſt be fully convinced, that the frogs of Horſes cannot have been formed to protect the tendons from injury. It has been proved by experiment, that the ſubſtance of tendons in health has no ſenſation; and, conſequently, that one inſen-

ſible body (viz. the frog) cannot have been made for the purpoſe of protecting an organ void of feeling. Again, the frog, being made of a wedge-like form, a great part of the tendon is not covered by the frog, and more than one half of it projects behind the tendon. If the frog had been made to act, as a cuſhion, to ſave the tendon, then its ſhape and magnitude would have been exactly equal to the tendons.

The practice of ſhoeing, very much depends on the functions of the frog being underſtood. If the opinions here advanced reſpecting its uſes be well founded, then it muſt follow, that paring the frog, and raiſing it from the ground by a thick heeled ſhoe, annihilates its functions, and ultimately, if not immediately, produces diſeaſe: and that, applying a ſhoe thin at the heel, and expoſing the

frog

frog to preſſure, is the only proper method to keep it in health. Moreover, it has been demonſtrated, from experience, that unleſs the frog ſuſtain an uniform preſſure, it becomes ſoft and inflamed, and the heels contracted: but if this organ be always in cloſe contact with the ground, then it will be callous, inſenſible, and healthy, and moſt of the diſeaſes incident to the foot prevented.

The ſame degree of preſſure applied to the frog, that produces only pleaſant ſenſation when in health, creates exquiſite pain when diſeaſed. It is therefore of great importance to preſerve the frog ſound, for when cut, it becomes highly ſuſceptible of every impreſſion: we might with as much wiſdom remove the ſkin of the human foot, when obliged to walk on ſtones, without ſhoes.

Granite and other hard ſubſtances have no effect on the frog, when it is preſerved, and the hoof properly ſhod: but, where it is ſoft and tender, in conſequence of being cut, and raiſed by a thick heeled ſhoe, one ſtroke from a projecting ſtone will produce pain, while perpetual preſſure, with a proper ſhoe, is attended with ſalutary effects.

Thoſe who conceive that the frog was not made to be in contact with the ground, and with that view cut the frog, to diminiſh its convexity, and employ high heeled ſhoes for its protection; would do well to conſider, whether their practice is in truth conformable to their own principles. If it be true, that no ſhoe, however high at the heel, applied to any hoof, can prevent the frog from occaſional preſſure, then it muſt follow that the practice and principles do not agree: and it can be demon-

ſtrated,

ſtrated, that no frog is exempt from preſſure, even if the ſhoe be turned up two inches at the heels. Where the roads are covered with a convex pavement, or with looſe ſtones, the frog is liable to be ſtruck by every ſtone that exceeds the thickneſs of the ſhoe: and in other ſituations, where there are no ſtones, the cavity of the ſhoe is filled with earth, ſo that the frog is frequently expoſed to preſſure. It therefore becomes a queſtion, whether repeated blows on a part that has been cut, made ſoft, and very ſuſceptible of impreſſion, will not produce more pain, and more diſeaſe, than conſtant and uniform preſſure applied to a frog in health.

Horſes wearing high heeled ſhoes, when a ſharp ſtone comes in contact with a ſoft and thin frog, are frequently liable to fall. It may be imagined, that if a Horſe feels pain from the preſſure of one blow,

great miſchief muſt enſue, when the ſame cauſe is many times repeated; and that, in proportion as the cauſe is repeated, the effect, or diſeaſe, muſt increaſe. But, it has not been conſidered, that in conſequence of always ſtanding on the frogs (even in the ſtable) on hard ſurfaces, theſe organs become totally inſenſible, and reſiſt even the hardeſt bodies without the leaſt irritation. Nor is this fact inexplicable, or peculiar to the Horſe. Do we not ſee that the palms of hands of ſmiths, and watermen, are callous, and feel no inconvenience from ſubſtances that would abſolutely bliſter a hand, in the habit of wearing gloves? And, is it not a fact, that the ſole of the human foot is equally void of feeling, when accuſtomed to walk without ſhoes?

Some writers have admitted that the frog was made to touch the ground; and yet have recommended

mended a ſhoe thick at the heel, which raiſes this organ from preſſure, and deſtroys its functions.

Having ſuperficially deſcribed the formation, and uſes of the cruſt, ſole, bars, and frog, I ſhall now proceed to examine the common method of cutting the hoof, and the form of ſhoe generally employed. We ſhall then be able to determine if that practice be incompatible with the principles here inculcated; and if it be capable of preſerving the hoof in its natural form, unimpaired by ſhoeing. This object ſhould be particularly kept in view; for that practice muſt indubitably be the beſt, that allows the different parts to perform their reſpective functions, and preſerves them in their original condition.

SECTION II.

The common Practice of shoeing Horses, and its Consequences.

BEFORE any shoe be fitted to the hoof, the bars are totally, and the frog partly, removed by an instrument called the butteris. If it be true, that the bars are made to prevent the heels from contraction, or, indeed, if the bars have any function, that function must be lost when they are destroyed. Any man, in the least acquainted with the wisdom of Nature, will be convinced, that if the bars had been of no use, they would not have been created. As they are always found in a natural hoof, the conclusion is self-evident, that they are of some use: that

that uſe we have attempted to demonſtrate, is, to preſerve the heels from contraction.

The removal of the bars is termed, opening the heels; and is performed for the expreſs purpoſe, that the heels may not contract, or the heels of the ſhoe preſs upon the ſole, and occaſion corns. But it is rather unfortunate, that this operation, intended to prevent corns, and contracted heels, ſhould be the remote cauſe of the very diſeaſes deſigned to be obviated. The frog being cut, is very ſuſceptible of injury, and incapable of acting as a ſtop to the animal, or performing its other functions.

When the hoof is thus prepared, a ſhoe is applied, thicker at the heel, than at the toe, broad in the web, having its upper ſurface concave, and the under ſurface convex, and four nails placed in each

quarter of the cruſt. *(See Plate II. figures the 1ſt and 2d.)* This is the Horſe-ſhoe, almoſt univerſally employed in this country; and a conſideration of its form, and application, will fully explain the alterations, and diſeaſes, which take place, when the hoof is cut as here deſcribed. The heels of the ſhoe, being high, will prevent the frogs from embracing the ground, and the concavity of the ſhoe at the quarters, and the nails (that are placed near the heels) will confine the growth of the cruſt, and contract the hoof.

It has been already ſtated, that the hoof is always conical, the lower part forming the baſis, and the upper part the apex of the cone; and that all the cruſt grows from the ſmalleſt part of the cone, viz. the coronet. As the cruſt is formed from the apex of the cone, and as the baſis is one third wider, it

is evident, that the cruſt grows obliquely, and that, when it has deſcended from the hair at the coronet one inch, all the cruſt below muſt deſcend in an equal proportion. Where no art is employed to alter the direction of the natural growth of the hoof, it will then be found, that the laſt inch of cruſt, at the baſis of the cone, will be about one third wider than the apex. *(See Plate II. figure the 1ſt.)* But when the frog, and bars, are taken away, and the common ſhoe applied; the concave part of the ſhoe confines the lower edge of the cruſt in the manner of a vice, and the two, or four laſt nails in the quarters, produce the ſame effect, in kind, but greater in degree, from the very edge of the cruſt to the clinch of the nails. *(See Plate II. figure the 1ſt.)* If the ſhoe be nailed at the heels, the cruſt at this part muſt remain of the ſame diameter during the application of that ſhoe, unleſs the power and incli-

nation of the cruſt to grow obliquely wider, exceed the power of the nails. The cruſt will ſtill continue to deſcend as before, at the coronet; but if the cruſt grow one inch from the top, the lower part deſcends an equal diſtance, and ſhould expand obliquely. At firſt view, it ſeems difficult to explain in what manner the laſt inch of cruſt can, in the leaſt degree, expand, when there are two fixed points with four nails, added to the concavity of the ſhoe on each ſide, that confines the lower part of the quarters to the width of the ſhoe. The fact is, that ſo great are the efforts of nature to counteract the bad effects of art, improperly applied, that the nails are abſolutely bent out of their courſe, by the overbearing influence of the growth of the cruſt. The ſhoe, therefore, which fitted the hoof when firſt applied, is generally too ſmall at the expiration of a month. It is obvious, that the diameter of the ſhoe

can

can never alter; but the cruſt deſcending, and expanding, becomes too wide for the ſhoe, and then the heels of the ſhoe (as the Farrier terms them) "are eating into the ſole," and producing corns. The outer edge of the ſhoe at the heels, which was before in contact with the cruſt, now reſts on the ſole.

It has been already obſerved, that the ſole, and frog at the heels, were formed to act as a ſpring; but while the ſhoe is fixed, and in actual contact with the inſenſible ſole at the heels, the deſcent of this organ is obſtructed, and the ſenſible ſole becomes bruiſed, and inflamed.

It therefore appears, that the diſpoſition of the cruſt to grow down obliquely, is even greater than the

the influence of the nails, and concavity of the quarters of the ſhoe, to confine the cruſt. Nevertheleſs, it is equally true that the nails, and ſhoe, have a powerful effect in diminiſhing the natural degree of expanſion of the hoof; and accordingly, from their perpetual influence, and the removal of the frog, and bars, we find that the heels of almoſt every Horſe (ſhod in this manner) are more or leſs contracted. The hoof, naturally circular, becomes altered to an oblong figure; and inſtead of being as wide, as long, the length of the hoof is frequently double, and ſometimes treble the width. *(See Plate I. figure the 2d.)* Any ſhoe, however, can be employed for a time, without pain, or any obvious inconvenience. If the ſenſible parts are not wounded, the Horſe will be found at firſt *with any ſhoe*; but ultimately, the common ſhoes, combined with the

common

common practice of cutting the hoof, generally produce corns, thrushes, or contracted feet, and frequently all these diseases in the same foot*.

It has been affirmed, that a long hoof, is a hoof of the greatest perfection: but, to suppose that art can improve and alter for the better the natural form of the hoof, is an absurdity too great for serious refutation: and as the common practice of shoeing produces a very considerable alteration in the form, and structure of the hoof, no stronger proofs can be required of the necessity of abolishing a system that produces deformity.

Contracted hoofs are certainly not so frequent in the country as in London. In the metropolis, the

* There is scarcely a post, or coach-horse, that is free from one, or all of these diseases.

Farrier thinks it part of his duty to make the foot clean, and what he terms handſome: but, in the country, the butteris is leſs uſed, and the ſtables are not equally foul and hot. Farther, Horſes in the country are turned out occaſionally in ſoft ground, where the hoofs are kept cool and moiſt; and if the ſhoes are removed, Nature has a better chance to reſtore what art has deſtroyed.

Large heavy Horſes are not ſo liable to contracted feet as light Horſes, but they are very ſubject to a diſeaſe called canker. This malady moſt frequently commences in the frog, and generally proceeds from want of preſſure.

As we have pointed out ſome of the inconveniences of the common ſhoe, and the baneful effects of cutting the frog and bars, we ſhall now proceed

to

to deſcribe the principles, and practice of ſhoeing, that have been found by experience to be capable of preſerving the form, ſtructure, and œconomy of the hoof, unimpaired by ſhoeing.

SECTION III.

The Principles, and Practice, of ſhoeing Horſes, which preſerves the Foot in Health.

THERE are two circumſtances neceſſary to be attended to in ſhoeing, viz. to cut the hoof, and apply a ſhoe. Before the hoof is protected by iron, ſome parts require to be removed, and others preſerved. This part of the practice is even of more importance than the form of the ſhoe. But, men have attended chiefly to the ſhoe, and not to its application, or to the hoof; and this error has produced more miſchief, and more enemies to the practice of the Veterinary College, than all the prejudices, and calumnies, of grooms and farriers. A watch, or any other machine

machine intended to regulate time, will perform its functions, in proportion as it is well, or ill made; but a horſe-ſhoe, may be formed mathematically correct, and yet produce lameneſs, if the bars and frog are removed, the heels of the ſhoe allowed to reſt on the ſole, and the frog raiſed from the ground. The very beſt ſhoe will produce more miſchief, when applied to a hoof improperly cut, than the worſt ſhoe, when well connected to a hoof prepared with judgment.

The firſt thing to be attended to, is to take away a portion of the ſole, between the whole length of the bars and cruſt, with a drawing knife. *(See Plate III. figure the 2d.)* The heels of the ſole, as has already repeatedly been obſerved, cannot receive the preſſure of the ſhoe without corns. To avoid preſſure, the ſole ſhould be made concave or hollow,

and not allowed to be in contact with the ſhoe. If there be any one part of the practice of ſhoeing, more important than the reſt, it is this removal of the ſole, between the bars, and cruſt. When this operation is performed, the Horſe will always be free from corns, whatever may be the form of the ſhoe; but, if the ſole is ſuffered to be flat at the heels, and preſſed upon by the ſhoe, it is of very little importance what kind of ſhoe is applied. Every groom, and every ſmith, is fully convinced that the ſole will not bear preſſure; and to prevent this effect they remove the whole of the bars, by opening the heels, and applying a concave ſhoe. We have endeavoured to prove, that the deſtruction of the bars is always improper; that this practice is the remote cauſe of corns, the very diſeaſe which it is intended to prevent; and that the bars are very neceſſary to preſerve the circular form of the

the hoof. Befides this, the heels of the fhoe fhould be made to reft on the junction of the bars with the cruft; *(fee Plate III. figure the 2d.)* but if the bars are removed, then the fhoe is fupported by the cruft only, and not by the folid broad bafis of cruft and bars united.

Any Horfe may be pricked in fhoeing by accident, but corns proceed from neglect. I have never feen a fingle inftance of this difeafe, where the fole at this part has been concave, the bars preferved, and the fhoe properly applied. It is neceffary that the fole fhould be cut before any other part of the hoof be removed. If the heels have been firft lowered by the butteris, then poffibly there may not be fufficient fole left to enable a drawing knife to be applied, without reaching the fenfible fole; whereas, by cutting the fole in the firft inftance, we can de-

termine

termine on the propriety of lowering the heels and ſhortening the toe. The ſole can then deſcend, without the motion being obſtructed by the ſhoe, and any foreign bodies that may have been received into this cavity, are always forced out when the ſole deſcends, without producing any miſchief.

It might be expected, that the ſole at this part, would be bruiſed by gravel and ſtones: but we find from experience, that the ſole never ſuffers, when there is a cavity between the bars, and cruſt, for ſuch ſubſtances to eſcape. When the ſhoe is applied, the cavity between the ſole, and ſhoe, ſhould be ſufficiently large at every part to admit a large horſe-picker, and particularly between the bars, and cruſt. If the ſole is naturally concave, a ſhoe with a flat ſurface applied to the cruſt, will not touch any part of the ſole; and if the ſole be flat, or even convex,

in the middle, or towards the toe, the quarters and heels of the ſole will generally admit of being made concave with a drawing knife, ſo as not to receive any preſſure from a flat ſhoe. I never ſaw a hoof, that would not admit of this operation, where the Horſe had been properly ſhod, and the bars, and heels preſerved. And it is equally true, that the ſole, when flat, and in contact with the ſhoe, is very liable to be bruiſed.

If a ſhoe with a flat upper ſurface, does not leave ample ſpace for a picker, between the ſole and ſhoe, then it is requiſite to make either the ſole or the ſhoe concave. Where the ſole appears in flakes, and thick in ſubſtance, it will be better to make the whole of the ſole concave, by a drawing knife; and this operation ſhould always be performed before the toe is ſhortened, or the heels lowered. When we have

made

made the ſole hollow, then a ſhoe with a flat ſurface will reſt only on the cruſt: but if the ſole be flat, or convex, and thin towards the toe and middle of the hoof, ſo as to prevent the poſſibility of removing the ſole at theſe parts to form a concavity, then it is neceſſary to employ a ſhoe ſufficiently concave to avoid preſſure, and to admit a picker. In this caſe, however, the ſole at the heels and quarters, even in convex feet, will generally allow of removal with a drawing knife; and then the quarters, and heels of the ſhoe, may be flat. It therefore follows, that where the ſole can be made concave, a ſhoe with a flat ſurface may with ſafety be applied; but where parts of the ſole, from diſeaſe, or bad ſhoeing, become flat, a ſhoe with a concave ſurface is required. As the hoof is always growing, and as the ſhoe preſerves it from friction, the toe of the cruſt requires to be cut once

in about 28 days. The more horn we can remove from this part, the fooner it will be proper to apply a fhoe thin at the heels, without mifchief to the mufcles and tendons, and the horfe will be lefs liable to trip.

The bars and frog fhould never be removed. Where there are ragged, and detached parts of the frog, it is better that they fhould be cut with any fmall knife, by the groom, than by the farrier; for if the latter is once allowed to touch the frog, the found parts are generally deftroyed. Where the frogs are not large and projecting, and the heels are higher than the frogs, then it is adviseable to lower the heels, which may be done by a rafp, or the butteris; for, in every cafe we are to endeavor to bring the frog in contact with the ground. We fhould never lofe fight of this principle, that the frog

muſt have preſſure, or be diſeaſed. If the frog does not touch the ground, it cannot perform its uſe; and no organ can be preſerved in health, that does not perform the functions for which it was made. Nevertheleſs, where the frog has been diſqualified for its functions for a conſiderable period, and become ſoft, it muſt be accuſtomed to preſſure by degrees. If the eyes have been deprived of light, it would be dangerous to apply the natural ſtimulus very ſuddenly. If the Horſe has been long without exerciſe, he will be diſeaſed, and muſt be brought to labor gradually: and, in like manner, the frog, and every other organ, that has been placed in an unnatural condition, will receive miſchief from any ſudden and violent change. If the quarters are high, and much exceed the convexity of the frog, it will be neceſſary to lower the heels, and endeavor to bring the frog, and heels of the ſhoe, on the ſame parallel line.

Where the Horſe is required to work, and the frog ſoft and diſeaſed, it may be gradually expoſed to preſſure, by lowering the hoof about the tenth of an inch, every time of ſhoeing, until the frog be hard, and equally prominent with the heels; or if the Horſe be not required to work, great advantages will be derived from ſtanding without ſhoes on hard pavement.

But, as the feet of Horſes are ſo variouſly deformed by bad management, it will be requiſite, in ſhoeing, to attend to each particular kind of hoof. If any form of ſhoe be indiſcriminately employed for all kinds of feet, it muſt frequently fail of ſucceſs: but by a proper attention to the different hoofs, we can generally improve the whole foot, ſo as to adopt the ſhoes recommended at the Veterinary College with advantage.

After the hoof has been cut, and properly prepared, then it becomes requiſite to apply a ſhoe, and to vary its length, breadth, and thickneſs, at the heel, ſurfaces, &c. according to the hoof. If the heels of the fore feet, are two inches and a half, or more in depth, the frog ſound, and prominent, and the ground dry, then only the toe of the hoof requires to be ſhortened, and afterwards protected by a ſhort ſhoe. *(See Plate I. figure the 1ſt.)* This ſhoe is made of the uſual thickneſs at the toe, but gradually thinner towards the heel. A common ſize ſaddle horſe ſhoe, may be about three-eighths of an inch thick at the toe, and one-eighth at the heel. The intention of this ſhoe, is to bring the frog compleatly into contact with preſſure, to expand the heels, to prevent corns, and thruſhes, and canker; and if the ſhoe be applied when the ground is dry, in the month of May or June, it may be continued

the

the whole ſummer; and in warm climates, where the ground is not ſubject to moiſture, no other protection for the hoof is requiſite.

It has been ſuppoſed that ſtones and other hard bodies would deſtroy the hoof; but whenever the frog is ſound, and the ground free from moiſture, the growth of the horn at the coronet, is always equal to the conſumption of hoof below: but in the winter months, when the roads are wet, the horn will be worn more from one day's labor, than that of ſeveral weeks in ſummer. I have known ſome light Horſes, whoſe hoofs have been ſufficiently ſtrong, to wear ſhort ſhoes the whole year; but ſuch caſes are not common. Nevertheleſs, the ſhort ſhoe can be employed on moſt horſes with advantage in ſummer, where the heels are from two inches and a half, to three inches in depth, and the

frog

frog equally prominent: but, unleſs the hoof has been properly preſerved, the heels, and frog, are generally too low to receive the ſhort ſhoe. The toe of the hoof requires to be ſhortened as much as poſſible; but if the frog touches the ground, no part of the heels ſhould be cut; and, by purſuing this practice, the heels will frequently grow ſufficiently high to receive the ſhort ſhoe.

In this country, we have only three, or four, dry months in the year; and therefore the ſhort ſhoe can ſeldom be employed in winter: but in caſes where this ſhoe has been indiſcriminately, and improperly applied, I have never ſeen any permanent inconvenience. The ſole has been worn thin, and the Horſe, on pavement or gravel, in great pain; but reſt for a few days, and applying a different ſhoe, has removed both cauſe, and effect.

Horſes for the turf may generally wear ſhort ſhoes on the fore feet, if the heels be high; as the cruſt of a blood horſe is generally ſtronger, and thicker, than that of heavy Horſes. But when the legs are weak, and bent at the knee, or the paſtern joints very long, or the heels low, this ſhoe is not to be employed.

During the wet months, we protect the whole of the cruſt by a long ſhoe; and if the heels of the hoof are low, we employ the ſame ſhoe in ſummer*.

In winter, when the heels are too high, it is better to lower them moderately with a raſp, than to wear them down by expoſure to the ground with the ſhort ſhoe; as the wet may deſtroy more horn

* The long ſhoe ſhould be made of the ſame thickneſs as the ſhort ſhoe, that is, about three parts at the toe, and one part at the heel.

than

than is neceſſary to be removed: but it cannot be too often repeated, that the ſole between the bars, and cruſt, ſhould be taken out before the heels are cut. If the heels are firſt removed, then poſſibly the horn left will be inſufficient to leave a proper degree of concavity between the bars, and cruſt. Where the Horſe has been in the habit of wearing very high heeled ſhoes, the frog would be liable to be bruiſed and inflamed, and the muſcles and tendons (that bend the leg) by the ſudden, and improper application of a ſhoe, thin at the heels, ſtretched beyond their tone. Indeed, whether the ſhoe, or hoof, be the cauſe that elevates the frog, the ſame attention is required, to bring it gradually in contact with the ground; we therefore find it abſolutely requiſite to thin by degrees the heel of the ſhoe, that the frog may be accuſtomed to hard ſubſtances. The thickneſs of the laſt ſhoe, at the heel, will always furniſh a proper criterion for the ſhoe

to

to be next employed. If only a ſmall portion of the hoof can be taken from the toe, the heel of the new ſhoe ſhould be about one-tenth of an inch thinner, than the ſhoe removed; and the growth of the cruſt will generally be equal to this diminution of iron. By reducing the heels of the ſhoe, in the ſame proportion as the hoof grows, a thin heeled ſhoe, may, in a few months be employed; and yet the horn being preſerved at the heels, and cut at the toe, every time of ſhoeing, the heels (ſhoe and hoof together) will be as high, and frequently higher, than when the former thick heeled ſhoes were applied. The cruſt that deſcends at the heels, we allow to remain; but ſubtract an equal quantity of iron from the heels of the ſhoe, and as much horn as poſſible, from the toe of the hoof. This ſyſtem ſhould be continued, until the heels of the ſhoe are about one-third the thickneſs of the toe. There are particular

kinds of hoofs, that admit of a much more ſpeedy change; but before theſe are deſcribed, it will be neceſſary to premiſe, that in proportion as the cruſt from the coronet to the toe increaſes, and the heels decreaſe in depth, the back ſinews, and muſcles, will be put upon the ſtretch. And the converſe of this propoſition muſt be equally true, that, as the heels are high, and the toe ſhort, theſe muſcles are relieved. It therefore follows, that every atom of horn, or iron, taken from the toe of the cruſt, or ſhoe, tends to relax the muſcles, and tendons, at the back of the leg; and that the removal of the horn, or iron, from the heels, produces the oppoſite effect. If theſe ſimple facts are kept in view, there can be no difficulty in aſcertaining the quantity of iron, that may be removed with ſafety from the heels of any ſhoe, without increaſing the labor of the muſcles and tendons.

If a Horſe has been in the habit of wearing ſhoes half an inch thick at every part, and the toe of the cruſt can be removed half an inch, (but none taken from the heels) then, if a ſhoe be applied, that is three-ſixths, or half an inch thick at the toe, and only one-ſixth of an inch at the heels, the flexor muſcles, and tendons, will not be ſtretched, but more relaxed than before: the relative ſituation of the toe, and heels, will be altered one-ſixth of an inch in favor of the muſcles, and tendons that bend the leg. In thoſe caſes, therefore, that admit of half an inch of horn being removed from the toe, we can at once apply a thin heeled ſhoe, provided that the frog be ſound, and parallel with the heels. If the frog ſhould not at firſt be ſufficiently callous to reſiſt hard bodies, without pain, this inconvenience will be frequently removed by reſt, and the conſtant preſſure of hard

pavement. But where, from contraction of the heels, or any other cause, the frog will not bear the pressure of the ground; and if it has been nevertheless most violently, and injudiciously, exposed to stones and other hard bodies, it is only necessary to remove the *cause*; that is, take off the shoes, and the *effects* will soon cease. But where the common thick heeled shoes are employed, the morbid effects are probably not seen for many months; and then, although the cause may be removed, the effects *will still remain*. If the Horse suffer no pain during the first month, from a thin heeled shoe, it may be continued with safety, and the whole hoof will be improved; while other shoes, that elevate the frog, gradually destroy its structure, and functions, without betraying the cause of the disease, till, perhaps, it is too late for the radical cure.

Young Horſes, with perfect feet, that have never been ſhod, or Horſes taken from graſs, do not always admit of horn being taken from the toe; and, where only a ſmall quantity of the toe of the cruſt can be removed, the heels of the ſhoe ſhould not at once be made thin. If no horn can be cut from the toe of the cruſt, and if the heels of the ſhoe that are firſt applied, be only one-third the thickneſs of the toe, then the flexor muſcles will be ſtretched, and very probably occaſion temporary lameneſs. The ſame precautions, therefore, are neceſſary for the firſt ſhoes, as for all the ſhoes to be afterwards applied. If the cruſt can be removed at the toe, nearly in the ſame degree as the part is to be covered with iron, and if the frog be ſound, and prominent, then a thin heeled ſhoe may at once be employed with ſucceſs. This ſhoe is chiefly recommended, by the circumſtance of a thin heel, being the beſt calculated to expoſe the

frog

frog to preſſure. But, if the heels of the hoof are higher than the frog, then no ſhoe of any ſort will allow the frog to be in contact with the ground. And we have repeatedly obſerved, that the frog cannot long be preſerved in health, without preſſure.

In all caſes, where the frog does not embrace the ground, with a thin ſhoe, it is neceſſary to cut the heels at the bottom of the hoof; and if high heeled ſhoes have been at the ſame time employed, it will require a conſiderable period to reſtore the hoof to health, as both ſhoe and hoof muſt be lowered. The ſhoe may be made gradually thin, and the heels of the hoof afterwards removed; or both theſe alterations may be effected at the ſame time, provided the frog be ſound, and that the abſolute depth of the ſhoe and hoof together, is not diminiſhed in a greater degree than the cruſt is ſhortened at the toe.

We

We have frequently remarked, that contracted feet, thruſhes, and canker, generally proceed from the frog not having been permitted to ſuſtain a conſtant preſſure. It is farther to be obſerved, that, as the frog may be effectually raiſed from the ground, even with a thin ſhoe, (where the heels of the hoof are allowed to grow beyond the frog) the ſame conſequences muſt enſue from this ſhoe, if the hoof be not properly cut, that take place from the common method of ſhoeing. In this caſe, therefore, as no poſſible ſhoe can bring the frog into contact with the ground, the heels ſhould be gradually lowered every time of ſhoeing, until the heels of the ſhoe, and frog, are equally prominent. When the frog, and the thin heeled ſhoe, are placed in the ſame line, and when the precautions here recommended, of ſhortening the toe, and lowering the heels, have been attended to, then it will be found, that the frog will become

totally infenfible, although expofed to the hardeft fubftances. *If the heels are not already contracted, they never can contract, fo long as the frog is in contact with the ground.* Thrufhes, canker, and corns, are alfo avoided, and in fhort, the whole hoof is preferved in its natural figure.

When the frog is once made to bear on the ground, and equally high with the fhoe, then it will not be requifite to lower any part of the heels, until they exceed two inches in height. In this cafe, if the ground be dry, it will be proper to have recourfe to the fhort fhoe; and if the ground is wet, to remove a fmall portion of horn from the heels. If the frog be long kept from the ground, then it generally becomes foft, and the blood, that fhould nourifh, and enlarge the frog, is confumed in the production of matter which is called a thrufh. But, where the frog

receives

receives the natural preſſure, there the growth is healthy, and it never becomes diſeaſed, or conſumed by friction, in a greater degree than it grows.

There are ſome few Horſes that require to be ſhod a little differently from the practice recommended, although the principles of ſhoeing are ſtill the ſame.

We generally find, that the toe of the ſhoe is worn out, before the heels, although the toe, when firſt ſhod, be thrice the thickneſs of the heel: but ſometimes, although very rarely, the Horſe wears the ſhoe nearly as much at the heels, as at the toe. In that caſe it will be requiſite to increaſe the thickneſs of the heels; for the toe, and heel of the ſhoe, ſhould be worn out nearly at the ſame time.

Horſes that are faſt trotters, and others that travel from thirty to forty miles per diem, ſhould have ſtronger ſhoes than uſual, both at the toe and heels: but ſtill the frog ſhould be in contact with the ground.

A ſhoe and nails, for a moderate ſized Coach Horſe, ſhould weigh from eighteen to twenty ounces. This ſhoe may be about one inch wide at the toe, and three-fourths of an inch at the heel; three-ſixths of an inch thick on the outſide of the toe, and one-ſixth on the inſide. The heels of the ſhoe ſhould be only one-ſixth of an inch, or one-third the thickneſs of the toe.

A Saddle Horſe ſhoe with nails, may weigh about twelve or fourteen ounces; wide at the toe ſix-eighths of an inch, but one-fourth leſs at the heel.

The

The toe of the ſhoe may be three-eighths of an inch thick on the outſide; the inſide of the toe and the heel one-eighth. Theſe proportions will be found generally proper for common feet; but it muſt be obvious that ſome little variation may ſometimes be requiſite. If the iron be well formed, the ſhoes for ordinary labor ſhould laſt twenty-eight days; and if any Horſe wears out his ſhoes before twenty-eight days, the ſubſtance of the next ſhoes may be increaſed.

Horſes that are very heavy, and employed in drays and carts, muſt wear more iron. The toe ſhould, nevertheleſs, be three times thicker than the heels, provided this quantity is not worn out before the toe. The ſhoes removed will generally point out the degree of wear in a given time, and alſo the points that have received the moſt friction.

And, if the heels of the ſhoe ſhould, by accident, be entirely deſtroyed, before the toe is worn out, or new ſhoes applied, no miſchief can enſue.

There is no kind of Horſe that will not be benefited by the frog's receiving preſſure, provided the hoof is not already diſeaſed. The length of the ſhoe is not leſs important than the breadth, and relative thickneſs of the heels and toe. Where the heels and frogs are two inches and a half perpendicularly high or upwards, and the ground is dry, we have recommended only the toe of the hoof to be covered with a ſhoe, gradually thinned from the toe to the heels. The heels of the ſhort ſhoe ſhould terminate about three-fourths of an inch *(ſee Plate I. figure* 1.*)* from the heel of the cruſt; but the heels of the long ſhoe ſhould reſt on the junction of the bars with the cruſt, poſterior to the ſeat of

corns.

corns. The length of the ſhoe commonly employed, is between both: the heels are generally oppoſite the ſeat of corns, and the length of the ſhoe contributes very much to produce this diſeaſe. The ſhoe, when firſt applied, is adapted to the lower part of the cone of the hoof; but, before the expiration of the month, the hoof deſcends, is expanded, and frequently becomes too large to fit the ſhoe; and then the heels of the ſhoe, that were at firſt equal with the cruſt, preſs upon the horny ſole, bruiſe and inflame the ſenſible ſole, and occaſion corns. This circumſtance, therefore, explains the cauſe of corns not generally appearing immediately, but after the ſhoe has been ſome time applied. The ſhort ſhoes are not allowed to approach the ſeat of corns; and then the heels of the ſole having great freedom of motion, this diſeaſe is prevented. And where the long ſhoes are properly

employed,

employed, if the heels reſt on the junction of the bars with the cruſt, and if the ſole, between the bars and the cruſt, is removed, corns are equally avoided.

As it has been recommended at the Veterinary College, to thin the heels of the ſhoe gradually, many have adopted the ſame principle in ſhortening the ſhoe: but we have attempted to demonſtrate that the ſhoe ſhould either reſt on the junction of the bars with the cruſt, or be ſhort of the ſeat of corns about three-fourths of an inch; and that the intermediate length will be liable to produce lameneſs.

The external and internal ſurfaces of the ſhoe ſhould alſo be conſidered. This forms a very important part of ſhoeing. It may be neceſſary to

repeat, that the common ſhoe of this country is concave on the inſide, beginning at the outer, and ending at the inner edge of the ſhoe, and convex on the outſide, not very unlike the form of an oyſter ſhell. The internal ſurface of the ſhoe is made concave, to avoid corns. But the quarters of this ſhoe produce the very diſeaſe they were intended to prevent, confine the heels of the hoof, and prevent their expanſion. The external ſurface of the ſhoe is made convex merely to prevent labor. As it was deemed neceſſary to make the internal ſurface concave, the external part of the ſhoe was made convex. It would have required more time, and more expence, to make the external ſurface flat, and the internal concave. The ſame ſtroke of the hammer that renders a flat ſurface concave, will make the oppoſite part convex.

I cannot

I cannot induce myſelf to believe, that any man would prefer, as a matter of choice, a convex ſurface to ſupport a great weight, conſtantly in motion; and particularly when the ſtreets and roads are alſo covered with convex ſubſtances. It is obvious, to demonſtration, that when two convex ſurfaces approach each other, only few points can come into contact. Mr. *Clark*, of Edinburgh, with propriety obſerves, that a walnut-ſhell, faſtened to the foot of a cat, is nearly as well adapted to keep that animal firm upon its legs, as convex ſhoes applied to the feet of Horſes.

The ſhoe that has been moſt recommended, is partly flat, and in part concave, on its upper ſurface. *(See Plate IV. figure the 2d.)* The flat portion of the ſhoe is intended to reſt only on the cruſt, while the concavity of the ſhoe is ſuppoſed

to

to be oppoſite the ſole, and the nails are placed in the centre of the ſeat, or flat part of the ſhoe. The principle of this ſhoe, is, to prevent any part of the ſole from receiving preſſure, and to oblige the cruſt to ſupport the whole weight of the animal. Before we examine the merits, or demerits, of this principle, it will be proper to enquire, whether in fact the practice conforms to the principle.

If it ſhould be found, where the ſhoe is applied, that the ſole very frequently receives preſſure, then we ſhall certainly demonſtrate, that the practice is incompatible with the principle. If it be good practice for the ſole to receive preſſure, then the principle muſt be erroneous, that attempts to make the ſhoe reſt totally on the cruſt: and if the principle be well founded, for the cruſt only to ſupport the ſhoe, then, if the ſole be in contact with the ſhoe, the

practice muſt be imperfect. Except a model be taken of every Horſe's foot, it is impoſſible for the reſting place of the ſhoe preciſely to fit the cruſt; for the cruſt not only varies exceedingly in different Horſes, but in the ſame hoof, at different parts. *(See Plate II. figure the 1ſt.)* The flat ſurface, therefore, that is only broad enough for the toe, is frequently too broad for the quarters and heels. And in all the ſhoes I have ever ſeen of this deſcription, the flat part of the ſhoe is made of the ſame breadth at the quarters, as at the toe. It is farther to be obſerved, that this ſurface very generally exceeds the cruſt at every part. In the ſame proportion as the ſeat of the ſhoe exceeds the breadth of cruſt, exactly ſo much of a flat ſurface is oppoſite an equal quantity of ſole. The principle of this ſhoe is thereby defeated by the practice; for inſtead of the ſeat reſting on the cruſt, it projects over the edge of the ſole.

It is therefore a fact, that while great pains have been taken to make a flat seat on the shoe, in order to support the crust only, and the web concave, in order to remove pressure from every part of the sole; that the seat has, nevertheless, very rarely fitted the crust, and consequently the soles of all flat feet at their connection with the crust, must receive more or less of pressure from the seat of the shoe. Where the sole is concave, this shoe will only rest on the crust; but a shoe that is flat on its whole internal surface, would answer the same purpose: for the concave part of the sole, opposite to the concavity of the web of the shoe, would receive no pressure even from a shoe wholly flat.

It has always been admitted, that the pressure of the shoe on the sole, is productive of mischief; and from the fact being well established, this shoe has

been invented to preſerve the ſole. We perfectly agree with the principle, that the ſole ſhould not receive any preſſure from the ſhoe; but, as hoofs, with thin cruſts, have flat ſoles, the ſhoe that has nails in the centre of a flat ſeat, *(ſee Plate IV. figure the 2d.)* muſt, in all caſes where the ſeat of the ſhoe is broader than the cruſt, preſs upon the ſole, and produce the very effect which is intended to be obviated.

As it is a fact known to all Farriers, that the ſole will not bear the preſſure of the ſhoe without injury; the common ſhoe is made concave within, for the purpoſe of preſerving the ſole. But we have endeavoured to prove, that this ſhoe does not anſwer the purpoſe; that the ſole is frequently bruiſed by the heels of the ſhoe; and, moreover, that the concavity of the quarters of the ſhoe confines the hoof, and produces

produces contraction. Both these kinds of shoes, therefore, occasionally press upon the sole, and are not well calculated to rest exclusively on the crust. Nevertheless, by cutting the sole properly, we find it very practicable to apply a shoe that will not press upon the sole, or produce the inconvenience of the common concave shoe, viz. that of confining the quarters.

It has been before observed, that, where the sole is removed, and made concave between the whole length of the bars and crust, a flat surface cannot touch, much less press upon the sole at this part. If the whole of the sole be sufficiently thick to admit of being concave, then the whole internal surface of the shoe may be made flat. But where the sole, towards the toe, is convex, or flat and very thin, a shoe altogether flat, or a flat seat, with the nails in

the middle, cannot be applied, without improper preſſure. The toe of the ſole, in this kind of hoof, is very generally more flat, and leſs thick, than the quarters, and heels, and cannot be made concave. But I have ſcarcely ever ſeen an inſtance, where the ſole could not be removed, the firſt or ſecond time of ſhoeing, between the whole of the bars and cruſt.

The ſhoe that we invariably apply to flat ſoles, will be found conſiſtent with the principle that has been ſo repeatedly inforced, namely, that of reſting only on the cruſt, preventing corns, and allowing the quarters to expand. The form of this ſhoe is concave at its upper part, oppoſite to the flat or convex portion of the ſole, with a narrow ſurface, only equal to the cruſt and nails; but at the quarters, and heels, where the ſole can be made con-

cave,

cave, there it is neceſſary to employ a flat ſurface. It therefore follows, that if the ſole at any part be neceſſarily flat, there the ſhoe oppoſite to the ſole muſt be concave, and the ſeat for the cruſt no wider than the nails: but where the ſole can be made concave, a flat ſhoe may be applied; and as the ſole, at quarters, can be preſerved concave, ſo the quarter of the ſhoe may be flat. The concavity of the upper ſurface of the ſhoe attached to the toe of the cruſt, has no influence whatever in producing contraction of the heels; but where the lower edges of the cruſt at the quarters are confined between two fixed points, there contraction muſt enſue. If the bars and ſole at the heels have been deſtroyed by the Farrier, ſo as to prevent the poſſibility of making a concavity between the bars and the cruſt, and if the Horſe be obliged to work, then it will be neceſſary to employ a bar ſhoe, to reſt on the frog, and raiſed from the

ſole

ſole at the heels. But where the ſole can be preſerved only for a few weeks, it will grow ſufficiently to be made concave with a drawing knife between the bars and cruſt; and then the heels of the ſhoe may be flat, without touching the ſole.

Mr. *Saintbel* employed a ſhoe with a flat upper ſurface; but, from not attending to the very important operation of removing the ſole under the heels of the ſhoe, and the indiſcriminate application of a flat ſurface at every part of the ſhoe, to every kind of hoof, it frequently failed of ſucceſs.

The beſt form for the external ſurface of the ſhoe, is a regular concavity; that is, the common ſhoe reverſed. This ſhoe leaves the hoof of the ſame figure when ſhod, as before its application. And it is evident, that a concavity has more points of con-

tact

tact with pavement and other convex bodies, than a flat or convex ſurface, and that the Horſe is conſequently more ſecure on his legs. A ſhoe that is flat externally, may preſerve the hoof equally well in health; but this form is not ſo well calculated to prevent the Horſe from ſlipping as a concavity.

We have already obſerved, that when Horſes are ſhod in the uſual manner, four nails are placed in each quarter of the cruſt, nearly oppoſite; and that this practice confines the growth of cruſt, and contracts the heels. To obviate this defect, the ſhoe ſhould be nailed all round the toe of the cruſt. The toe is by much the thickeſt part of the cruſt in the fore hoofs*, and therefore capable of receiving nails, with leſs danger of wounding the ſenſible parts

* In the hind feet, the quarters and toe are nearly of the ſame ſubſtance.

within, than at the quarters, where the cruſt is generally thin: and, by preſerving the greater part of the quarters free from nails, the heels are allowed to expand. If, however, the whole quarters, and heels of the ſhoe have no nails, the great length of lever from the laſt nail to the extremity of the heel, will be very liable to diſplace the nails, and to occaſion the loſs of the ſhoe.

About one inch and half of the heels of the ſhoe may be generally left without nails: but for hunting, it is requiſite to place one more nail on the outſide quarter. The outſide is thicker than the inſide cruſt; and if the nails are kept from the heel on the inſide, the quarters of the hoof will not be confined; but, where the cruſt is thin or broken, this length of ſhoe, without nails, would be too long. It is a great inconvenience to loſe a ſhoe at any time, but

particularly

particularly ſo in the field; and as hunters are liable to be in deep and ſtiff ground, they require the ſhoes to be more firmly connected with the cruſt, than Horſes uſed to pavement, or a turnpike road. As this practice of nailing at the toe prevents the nails from forming two oppoſite fixed points, and permits the cruſt to expand, it ſhould be always adopted.

The nail holes, and the nails, employed at the College, are made very differently from thoſe in common uſe. The nail holes are ſtamped with a punch of a wedge-like form, *(ſee Plate IV. figure* 4.*)* and the heads of the nails are of the ſame figure, namely, conical, *(ſee Plate IV. figure* 5.*)* and received into the nail holes; and then, ſo long as the ſhoe remains, ſo long there are heads to the nails.

This kind of nail is the invention of Mr. *Spencer*, a very ingenious Horfe Nail Maker; and although the quality of the iron, and the form of the nail, render this article infinitely fuperior, not only in fhape, but durability, yet the price is not more than feven pence per thoufand above the common nails. And, from the experience I have had of their utility, I am perfuaded that the fhoes are not only more fecurely attached to the hoof, but that the Smith will find it very œconomical to ufe them univerfally in his practice. But, if the increafe of expence were an object of confideration, it is of much more confequence not to lofe a fhoe, and particularly in hunting*.

* Thefe nails are fold in London, in any quantity, at No. 7, in the Cloifters, near Bartholomew Hofpital.

The head of the common nail is not conical, but nearly ſquare; and no part is received into the nail hole. When the nail is driven into the ſhoe up to the head, the Farrier generally continues to hammer with great violence; and, as the nail hole cannot admit the head, the texture of the nail, contiguous to the head, is ſhivered, and in a few days is broken: whereas the head of Mr. *Spencer's* nail operates as a wedge: the more it is hammered, the more firmly it is connected with the nail hole, ſo as to become part of the ſhoe. Moreover, the head of the common nail, when not injured by the Farrier, projects beyond the ſhoe, and when worn out, the ſhoe is liable to come off. This accident will more frequently happen, if the nails are placed in the old nail holes of the cruſt: before the nail holes of the ſhoe are ſtamped, the Farrier ſhould examine the ſituation of the former nails; and by having new

cruſt for the nails, the ſhoe will be more firmly connected with the hoof.

Horſes that are employed in the ſhafts of heavy carriages, require an artificial ſtop for the hind feet, and, in hilly ſituations, for the fore feet. But where the frogs are ſound and prominent, and the Horſe not employed to reſiſt more than his natural weight, (if there be no ice on the ground) artificial ſtops are uſeleſs.

It is of great importance for the frogs of the hind feet to be as much in contact with the ground as poſſible. Where the heels of the cruſt are not kept low, and the horny frog prevented from receiving its due degree of preſſure, Horſes are very ſubject to violent inflammations, and ſuppurations of the ſenſible frog, and canker extending even to the ſole.

At

At Woolwich, where I have had the honor to ſee this practice particularly attended to, we have had no ſuch diſeaſe; although I have ſeen numbers of the ſame kind of Horſe incurably diſeaſed with canker, from the common practice of ſhoeing. This practice, is, to cut the frog, leave the heels of the cruſt very high, and turn up the outſide heel of the ſhoe only. The frog then becomes ſoft and diſeaſed; and the internal part of the extremity neceſſarily ſupports ſo much weight, as frequently to occaſion ſplents and ſpavins.

It is very obvious, that the raiſing one ſide of the ſhoe, and depreſſing the other, is unnatural, and muſt require the inſide quarter of the hoof to bear more than its due proportion of weight. To remedy this defect, ſome Farriers turn up both heels of the ſhoe: but this practice is very often produc-

tive of ſtill greater miſchief; for the projection of the ſhoe on the inſide, bruiſes the ſoft parts above the hoof of the oppoſite hind leg, and a ſinus very ſoon forms between the hoof and ſoft parts, called by Farriers, a Quittor.

The ſhoe employed at the Veterinary College, prevents both diſeaſes. We turn up the outer heel of the ſhoe only: but, in order to guard againſt unequal preſſure, the horn of the outer quarter is cut away, while the internal part is preſerved. Where the hoof is ſufficiently thick to admit of removal on the outſide heel, in the ſame proportion as we raiſe the heel of the ſhoe, then the weight of the animal, on ſtones and hard ground, is mutually ſupported; and on ſoft ground, the heels of both quarters of the ſhoe will be nearly equal.

Where the horn does not admit of ſufficient removal at the outer quarter, the thickneſs of the ſhoe ſhould be increaſed until the heels of both ſhoes are placed in the ſame parallel. This kind of ſhoe we employ on the hind feet of Horſes for hunting; and in hilly countries, where the heels of the fore feet are low, the frogs ſmall, and paſtern joints long, it is neceſſary to apply the ſame kind of ſhoe on the fore feet. But an artificial ſtop for the hind feet will frequently anſwer every purpoſe. Horſes that are heavy, and not liable to over-reach, and that require an artificial ſtop on the fore feet, for froſt, may, if the heels require to be lowered, have a bar ſhoe; *(ſee Plate IV. figure the 3d.)* but whenever this ſhoe is applied, the middle and upper part of the bar ſhould always be in contact with the frog, and the oppoſite part of the bar turned up ſo as to embrace the ground. When this bar ſhoe is ap-

plied, the frog receives preſſure, and this is the great advantage of the bar. The common bar ſhoe is applied purpoſely to guard the frog from preſſure; but, if the bar cannot be made to reſt on the frog, it is productive of miſchief. The nails of this ſhoe ſhould be carried nearer the quarter, on the outſide, than the common ſhoe, or it will be liable to become looſe, and detached from the hoof. Where the frog is ſmall, but ſound, and the heels high, and obliged to be removed conſiderably, to bring that organ in contact with the ground, then a bar ſhoe is very advantageous.

A thin heeled ſhoe would equally expoſe the frog to preſſure; but then the flexor muſcles, and tendons, would be ſtretched and injured, if the heels of the hoof were ſuddenly lowered, and a thin heeled ſhoe at the ſame time applied.

It has been before obſerved, that one method to remedy this defect, and to bring the frog into contact with preſſure, without miſchief to the muſcles, and tendons, is, to thin the ſhoe and cut the heels of the hoof gradually. But, where the frog is capable of ſuſtaining immediate preſſure, the bar ſhoe may with great advantage be applied, without any additional exertion to the muſcles, and tendons; and the bar being made to reſt on the frog, keeps the heels expanded. This ſhoe may alſo be employed for land cracks. The quarter of the hoof oppoſite the crack ſhould be removed, ſo as not to receive any preſſure from the ſhoe; but the frog muſt be in contact with the bar.

Horſes are very liable to ſtrike one leg with the oppoſite hoof; this accident is termed cutting. The part moſt frequently bruiſed, is, the ſide of the fet-

lock joint. Where the toe of the hoof is turned out, the inner quarters of the ſhoe or hoof are more frequently the parts that do the miſchief: but when the toe is turned in, the injury is done by the anterior part of the ſhoe.

If the toe is turned out, the inner quarter of the cruſt is moſt frequently lower than the outer. This condition of the hoof neceſſarily inclines the fetlock joint of the foot that ſupports the weight, nearer to the foot in motion.

Farriers generally attend to the hoof that cuts, and not to the hoof of the injured leg: but while the leg is in the air, no ſhoe can alter its direction; and the ſmall quantity of horn, or iron, that can be removed from the hoof and ſhoe, very rarely prevents cutting. •But it is very practicable to alter

the

the poſition of the leg, that ſupports the animal; and thus the foot in motion may purſue the ſame direction without being liable to cut. The outer quarter of the cruſt ſhould be lowered, and the inner quarter preſerved. This operation will tend to make the bottom of the hoof the reverſe of its former ſtate, that is, the inſide quarter higher than the outſide, and this will throw the fetlock joints farther from each other.

Where the ſole is thin, very little of the cruſt can be removed from the outſide; and then it will be neceſſary to attend to the ſhoe. The inner quarter ſhould be thickened, and the outer quarter made thin; which will produce the ſame effect, as altering the horn; or, if the hoof be ſufficiently ſtrong, both theſe remedies may be employed at the ſame time.

This

This mode of ſhoeing will alſo ſucceed, where the Horſe cuts below the knee, called the ſpeedy cut. But, if the toes of the hoof are turned in, then it will be frequently found, that the outſide quarters are the loweſt: wh enthis occurs, we muſt purſue the oppoſite practice. The inner quarter of the hoof only ſhould be lowered, and the outer quarter of the ſhoe made thicker than the inner.

By purſuing the ſyſtem we have recommended, the natural form of the hoof may be preſerved, and free from corns, contracted feet, thruſhes, and canker.

CONCLUSION.

FROM what has been obſerved, it appears—

1. That the natural form of the fore feet of Horſes, before any art has been employed, approaches to a circle; and,

2. That the internal cavity of the hoof, when circular, is compleatly filled by the ſenſible parts of the foot.

3. That the hoof is compoſed of horny inſenſible fibres, that take the names of cruſt, ſole, bars, and frog.

4. That

4. That the cruſt is united with the laſt bone of the foot, by a number of laminated, elaſtic ſubſtances.

5. That the uſes of the laminæ are, to ſupport the weight of the animal, and, from their elaſticity, to prevent concuſſion.

6. That the horny ſole is externally concave, internally convex, and united by its edge with the inferior part of the cruſt.

7. That the uſes of the horny ſole are, to act as a ſpring, by deſcending at the heels; to preſerve the ſenſible ſole from preſſure, and (with its concavity) to form a convexity of the earth.

8. That the external bars are nothing more than a continuation of the cruſt, forming angles at the heels.

9. That

9. That the internal bars are a continuation of the laminæ of the cruſt, attached to the horny ſole at the heels, within the hoof; and that theſe inſenſible laminæ are intimately united with ſenſible laminated bars, connected with the ſenſible ſole.

10. That the uſe of the external bars, is to preſerve the heels expanded; and the uſe of the internal horny bars, to prevent ſeparation, and diſlocation of the horny ſole from the ſenſible ſole.

11. That the external frog is convex, and of an inſenſible, horny, elaſtic nature.

12. That the internal ſenſible frog, is of the ſame form, very highly elaſtic, and united with two elaſtic cartilages.

13. That the frogs are not made to protect the tendon, as Mr. *Saintbel*, and other writers, have ſuppoſed.

14. That the uſe of the frog, is to prevent the Horſe from ſlipping, by its convexity embracing the ground, and from the elaſticity of the ſenſible, and horny frogs, they act as a ſpring to the animal, and keep expanded the heels.

15. That the common practice of ſhoeing, is, to cut the frog, and totally remove the bars.

16. That the removal of the bars and frog, deprives theſe organs of their natural function.

17. That the ſhoe commonly employed, is thicker at the heel then at the toe.

18. That this ſhoe is convex externally, concave internally, and four nails placed in each quarter of the cruſt.

19. That the ſhoes being nailed at the heels, confine the quarters of the cruſt, and produce contraction.

20. That the frog being raiſed from the ground by a thick heeled ſhoe, becomes ſoft, and very ſuſceptible of injury.

21. That the ſhoe being thick at the heel, only preſerves the frog from preſſure in the ſtable, and on ſmooth ſurfaces, while ſharp and projecting ſtones are perpetually liable to ſtrike the frog at every ſtep.

22. That the frog being ſoft, becomes inflamed whenever it meets with preſſure from hard bodies.

23. That the concavity of the ſhoe within, tends to prevent the expanſion of the quarters, and to bruiſe the heels of the ſole.

24. That the convexity without, is making the Horſe very liable to ſlip.

25. That contracted hoofs, corns, and frequently thruſhes and canker, are to be attributed to this practice.

26. That the intention of ſhoeing, is to preſerve the hoof ſound, and of the ſame form and ſtructure as Nature made it; and as the common practice is altering

altering its form, and producing diſeaſe, there can be no doubt, but, that the common practice of ſhoeing is imperfect, and requires alteration and improvement.

27. That it is very practicable to preſerve the hoof circular, and free from corns, contraction, thruſhes, and canker.

28. That to accompliſh this very deſirable object, it is neceſſary, in all caſes, firſt to endeavor to remove a portion of the ſole, between the whole length of the bars and cruſt.

29. That the ſole ſhould be made concave at the toe, with a drawing knife, in all caſes where the horn is ſufficiently thick to admit of ſuch removal.

30. That

30. That the internal ſurface of the ſhoe may be flat, whenever the whole of the ſole is concave, and will admit of a picker between a flat ſhoe and the ſole.

31. That when the anterior portion of the ſole is thin, or flat, or convex, and cannot be made concave, the ſhoe at this part ſhould be made concave.

32. That as the cruſt, in flat feet, is always thin, the ſhoe at the toe ſhould have a very ſmall ſeat, only equal to the nails.

33. That as the ſole, at the quarters, even in flat, or convex hoofs, will very generally admit of removal, the quarters and heels of the ſhoe ſhould be flat.

34. That while the quarters, and heels, of the ſhoe, on the upper ſurface, are flat, the concavity

of

of the ſhoe at the toe has no kind of influence, in contracting the heels.

35. That the external ſurface of the ſhoe ſhould be regularly concave, to correſpond to the form of the ſole, and cruſt, before the Horſe is ſhod.

36. That this external concavity of the ſhoe, is well calculated to embrace the ground, and to prevent the Horſe from ſlipping.

37. That the relative thickneſs of the ſhoe, at the toe and heel, ſhould be particularly attended to.

38. That the wear of the ſhoe, at the toe of the fore feet, is generally three times greater than the conſumption of iron at the heels.

39. That

39. That the heels of the ſhoe ſhould be about one-third the ſubſtance of the toe.

40. That this form of ſhoe is preferred to a high heel, as it allows the frog to perform its function, by embracing the ground, and acting as a ſpring.

41. That the weight of the ſhoe being diminiſhed at the heel, the labor of the muſcles, that bend and extend the leg, is diminiſhed.

42. That where no part of the cruſt can be removed from the toe, and the Horſe has been in the habit of wearing high ſhoes, the heels ſhould be made only one-tenth of an inch, every time of ſhoeing, thinner than the ſhoes removed.

43. That if the frog be callous and ſound, and the toe admits of being ſhortened, the iron may be diminiſhed at the heels, in the ſame proportion as the toe is ſhortened.

44. That the muſcles and tendons will be exerted beyond their tone, if the heels of the ſhoe are not gradually thinned as the horn grows, or as the toe of the cruſt can be removed.

45. That young Horſes, with perfect feet, ſhould not have thin heeled ſhoes at firſt, unleſs the cruſt at the toe, can be removed in the ſame degree as the iron at the toe exceeds the heels.

46. That where half an inch of horn can be taken from the toe of the cruſt, a ſhoe thin at the heel

may be at once applied without any injury to the mufcles and tendons.

47. That where the heels exceed two inches in depth, and the frog equally prominent, and the ground dry, a fhort fhoe, thin at the heels, may be applied.

48. That the heels of this fhoe fhould not reach the feat of corn, between the bars and cruft.

49. That in warm climates, and in this country in fummer, the wear of the horn expofed to the ground, will not be greater than the growth from the coronet.

50. That where the heels are more than two inches high, and the ground wet, it is better to lower

lower the heels by the butteris, than to wear them down by friction with the ground.

51. That it is not ſafe to employ the ſhort ſhoe on wet ground, except in blood Horſes with very thick cruſts, and then only with great attention to the conſumption of horn.

52. That the long thin heeled ſhoe ſhould reſt on the ſolid junction of the bars with the cruſt.

53. That the nails ſhould be carried all round the toe of the cruſt.

54. That the nails ſhould be kept as far as poſſible from the heels, and particularly in the inſide quarter.

55. That where the cruſt is thin, the nail holes of the new ſhoe ſhould not be made oppoſite, but between the old nail holes of the cruſt.

56. That the nail hole ſhould be made with a punch, of a wedge-like form, ſo as to admit the whole head of the nail into the ſhoe.

57. That the head of the nail ſhould be conical, to correſpond with the nail hole.

58. That the ſhoe and nails of a common ſized coach Horſe may weigh about eighteen ounces.

59. That the ſhoe and nails of a ſaddle Horſe may weigh twelve ounces.

60. That

60. That the ſhoe ſhould remain on the hoof about twenty-eight days; but if it wears out before this period, the next ſhoes ſhould be made thicker.

61. That Horſes employed in hunting, in froſt, and in the ſhafts of carriages, require an artificial ſtop on the hind feet, and in ſome ſituations on the fore feet.

62. That whenever this ſhoe is employed, it ſhould be turned up on the outſide heel, and the horn of the ſame heel lowered.

63. That the horn on the inſide heel ſhould be preſerved, and the heel of the ſhoe more or leſs thick, in proportion to the horn removed on the outſide heel.

64. That

64. That this ſhoe, when applied, is generally as high on the inſide, as on the outſide heel.

65. That a bar ſhoe is very beneficial where the frog is hard and ſound, and where the heels have been much removed, to bring the frog in contact with preſſure.

66. That the upper part of the bar ſhould reſt on the frog, and the part oppoſite the ground turned up, in order to act as a ſtop.

67. That when this ſhoe is applied, the frog receives preſſure, the heels will be expanded, and the muſcles and tendons not more ſtretched than before the heels were lowered.

68. That

68. That this ſhoe may be applied for ſand cracks, but no part of it ſhould be ſupported by the cruſt oppoſite the crack.

69. That where, from bad ſhoeing, the bars are removed, and corns are produced, a bar ſhoe may be employed, to prevent preſſure oppoſite to the ſeat of corn.

70. That where the ſole is too thin at the heels to admit of any removal with a drawing knife, the bar ſhoe may be applied with advantage.

71. That in this caſe the heels of the ſhoe ſhould be raiſed from the heels of the cruſt, and the bar reſt on the frog.

72. That the hoof being cut, and a ſhoe applied, as we have directed, will preſerve the hoof in its circular form, and free from contraction, corns, thruſhes, and canker.

EXPLANA-

Plate. I

Fig. I

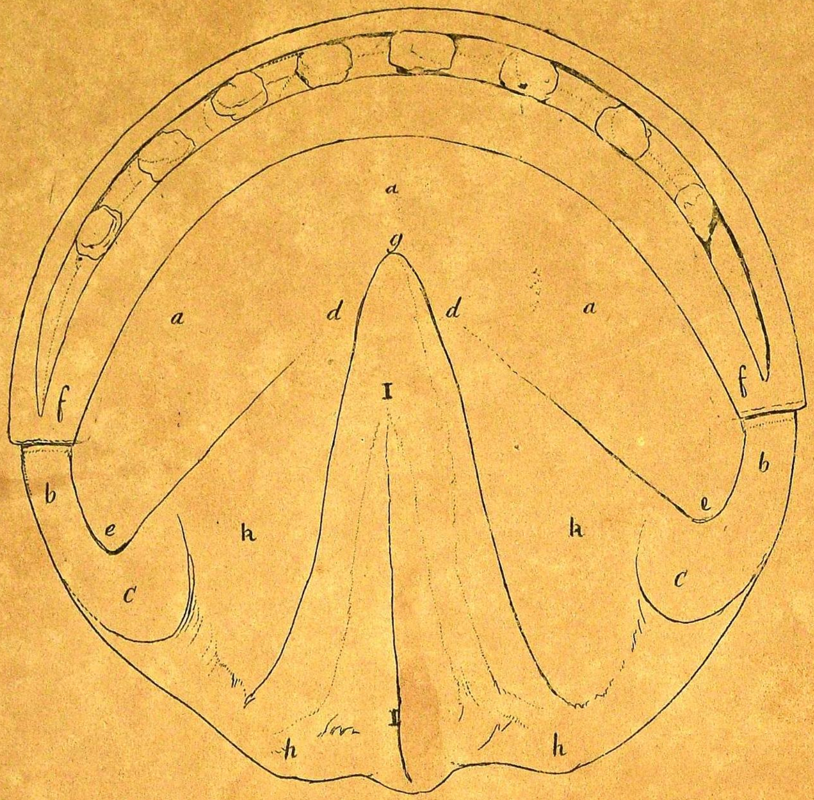

Fig. II

EXPLANATION
OF
THE PLATES.

PLATE I.

FIGURE THE FIRST.

A view of the natural hoof of the Horſe, being of a circular form, and ſhod with a ſhort ſhoe.

a a a The external ſurface of the ſole, of a concave form.
b b The inferior edge of the cruſt at the heels.
c c The junction of the bars with the cruſt.
d d The points of the bars.
e e The ſole between the heels of the cruſt and bars, the ſeat of corn.
f f The heels of the ſhort ſhoe not allowed to reach the ſeat of corn at *e e*.
g The toe of the frog.
h h The heels of the frog.
I I The cleft between the heels of the frog, the external ſeat of thruſhes.
k k Two cavities between the ſides of the bars, and the ſides of the frog.

FIGURE THE SECOND.

A view of the hoof, with contracted heels, produced by the common method of ſhoeing.

a a a The ſole.

b b The original ſeat of the bars.

c c The ſeat of the original cavities, between the bars and cruſt, but now, from contraction, ſolid horn.

d d The frog very much compreſſed by the contraction of the heels of the cruſt.

e e The width of the hoof at the heels, not being more than one-half of its length from *f* to *g*.

f The extremity of the heels of the frog.

g The toe of the cruſt.

PLATE

Plate. I

Fig. I

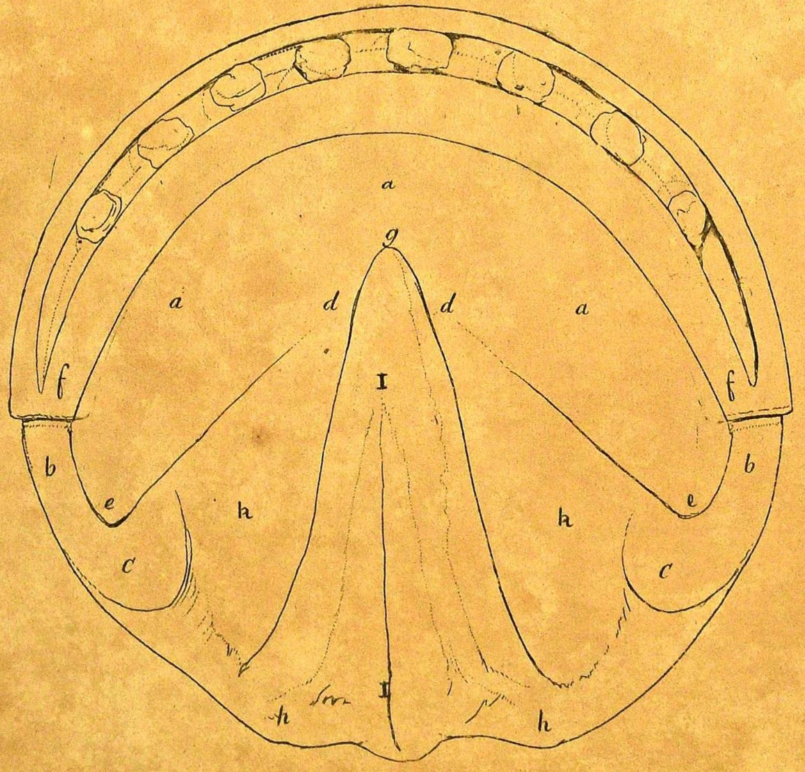

Fig. II

Plate II

Fig. I

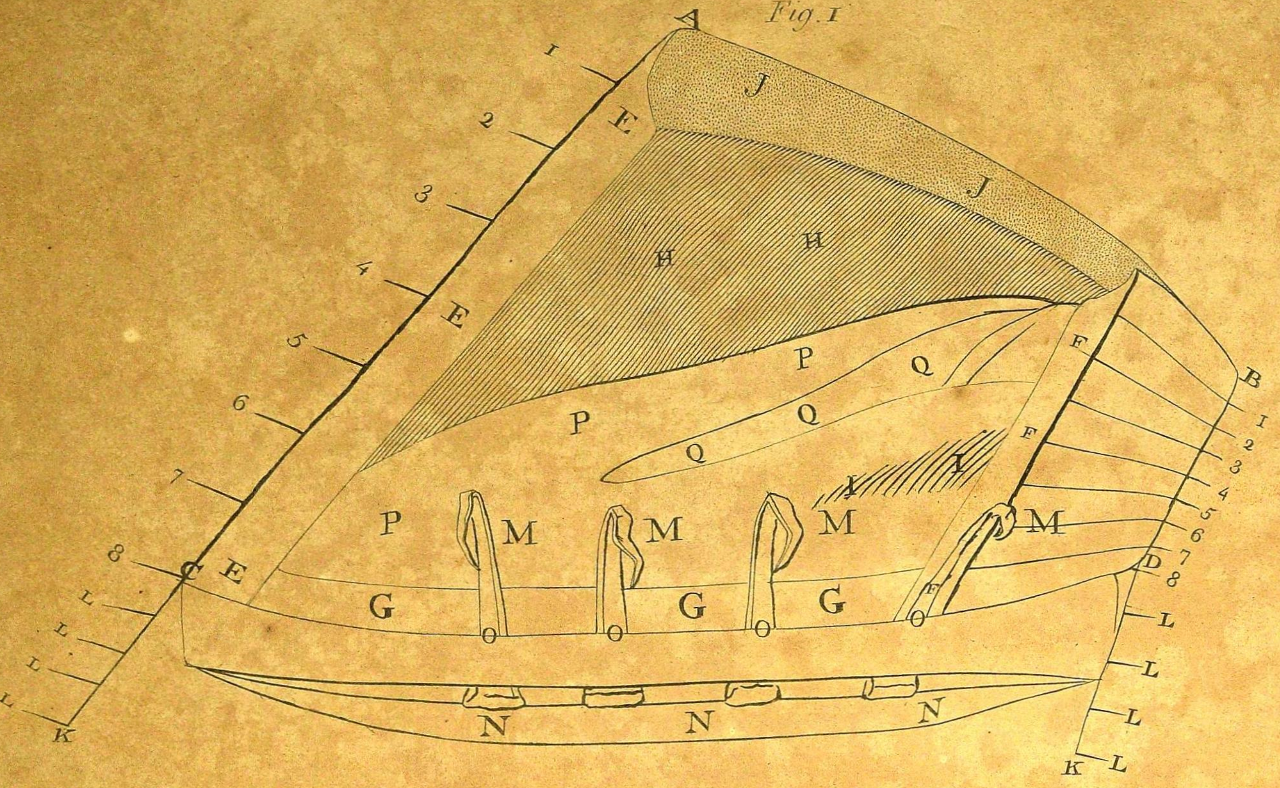

Fig. II

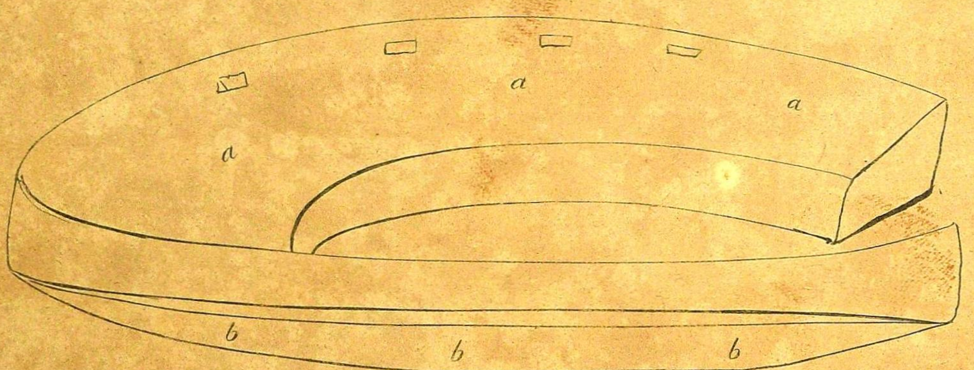

PLATE II.

FIGURE THE FIRST.

A ſide view of a hoof, ſhod with the common convex ſhoe, and a ſection of the cruſt, to demonſtrate its relative thickneſs at the toe and quarters, with a lateral and interior view of the ſole, and the laminæ of the cruſt and bars.

A B C D Two oblique lines drawn from the coronet, to ſhew that the cruſt is of a conical form.

A B The apex, *c d* the baſis of the cone.

1 2 3 4 5 6 7 8 Tranſverſe lines to mark the increaſe of the cone as the cruſt deſcends from the coronet, the laſt line being about one-third wider than the firſt.

E E E The thickneſs of the cruſt of the fore hoof, from the coronet to the toe, the middle portion of the cruſt between the toe and quarters, being removed.

F F F The thickneſs of the cruſt, at the inner quarter, not being more than two-thirds the ſubſtance of the cruſt at the toe.

G G G The lateral edge of the ſole, where it unites with the cruſt.

H H A ſide view of the horny laminæ lining the cruſt.

I I The termination of theſe laminæ, attached to the internal ſurface of the horny ſole, to form the internal part of the inſenſible bars.

J J The coronary cavity.

K K A continuation of the two oblique lines, to mark the future defcent of the cruft from the coronet.

L L L L Four tranfverfe lines on each fide, to fhew that as the cruft defcends from the figure 8, that it fhould become wider from fide to fide, as well as longer from the heels to the toe.

M M M M Four nails in the inner quarter of the cruft, oppofed to four other nails in the outer quarter; to fhew their influence as high as the clinches, in preventing the expanfion of the cruft from fide to fide.

N N N The convex furface of the fhoe oppofite the ground.

O O O O The concave furface nailed to the cruft, that co-operates with the nails to prevent the natural expanfion of the heels in width, and compels the hoof to increafe in length from the heels to the toe, in proportion as the quarters are made to contract.

P P P P The internal furface of the fole, of a convex form.

Q Q Q The internal furface of the frog.

FIGURE THE SECOND.

The common fhoe removed from the hoof, to fhew its internal furface to be concave, and the external furface to be convex.

a a a The internal furface of the fhoe, oppofite the fole.

b b b The convex furface, in contact with the ground.

PLATE

Fig. II

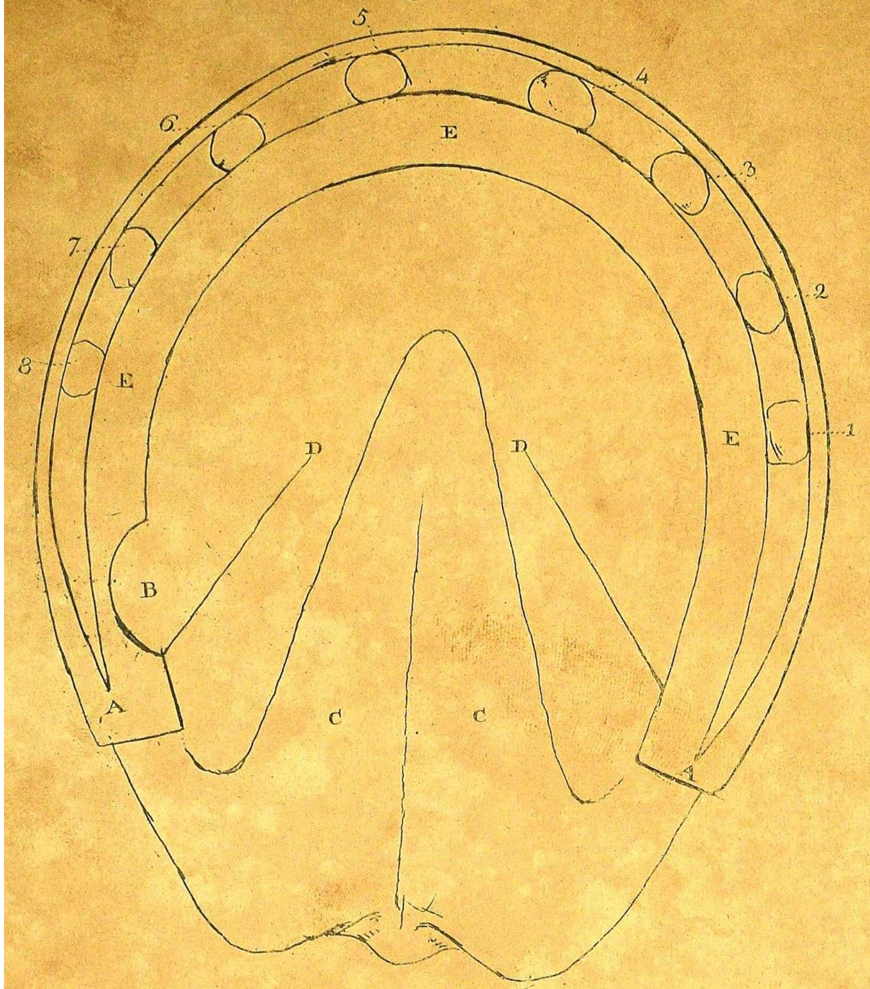

Fig. I

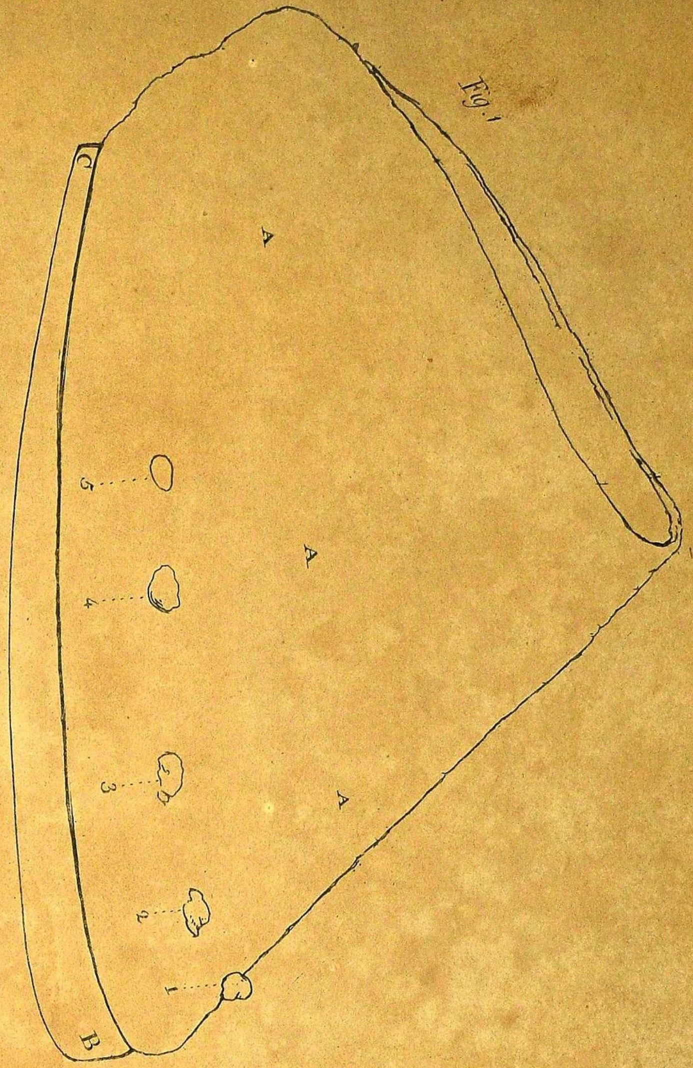

PLATE III.

FIGURE THE FIRST.

A ſide view of the hoof, ſhod with a long ſhoe.

A A A The hoof.

B The toe of the ſhoe.

C The heel of the ſhoe, only one-third the thickneſs of the toe, and made gradually tapering from B.

1 2 3 4 5 The clinches of the nails placed in the outſide quarter and toe of the cruſt.

FIGURE THE SECOND.

An inferior view of the ſhoe, to ſhew the web to be concave externally, with the nails in the cruſt all round the toe, and part of the ſhoe removed oppoſite the ſeat of corn.

A A The heels of the ſhoe made flat on the upper ſurface, to reſt on the ſolid baſis of the junction of the bars with the cruſt, and thin, for the purpoſe of being on a parallel line with the frog.

B The ſeat of corn made concave with a drawing knife, and part of the ſhoe removed, to ſhew this concavity.

C C The heels of the frog equally prominent with the heels of the ſhoe.

D D The points of the bars.

1 2 3 4 5 6 7 8 The eight nails.

E E E The external ſurface of the web of the ſhoe made concave oppoſite the ground.

PLATE IV.

FIGURE THE FIRST.

A front view of the internal cavity of the hoof, and ſhod for hunting, or for ice.

A A A The porous concavity at the ſuperior part of the hoof, above the laminæ, for the reception of the convex vaſcular ring of the foot: the dots intended to expreſs ſmall holes for the termination of the blood veſſels.

B B B An interior view of the horny laminæ lining the cruſt, attached, when living, to correſponding laminæ covering the laſt bone of the foot, to perform the function of ſprings, and ſupport the weight of the animal.

C The middle of the internal part of the horny frog, of a convex figure, to be received into the middle of the cavity of the ſenſible frog, to prevent diſlocation of thoſe organs.

D The outſide heel of the ſhoe turned up.

E The inſide heel of the ſhoe not turned up, and yet parallel with the outſide heel, from the horn being removed on the outſide *(d)*, and not touched on the inſide *(e)*.

Fig I

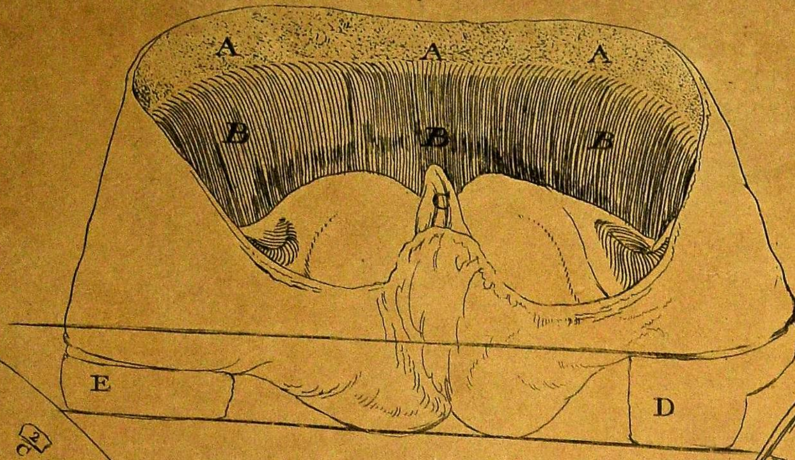

Fig II

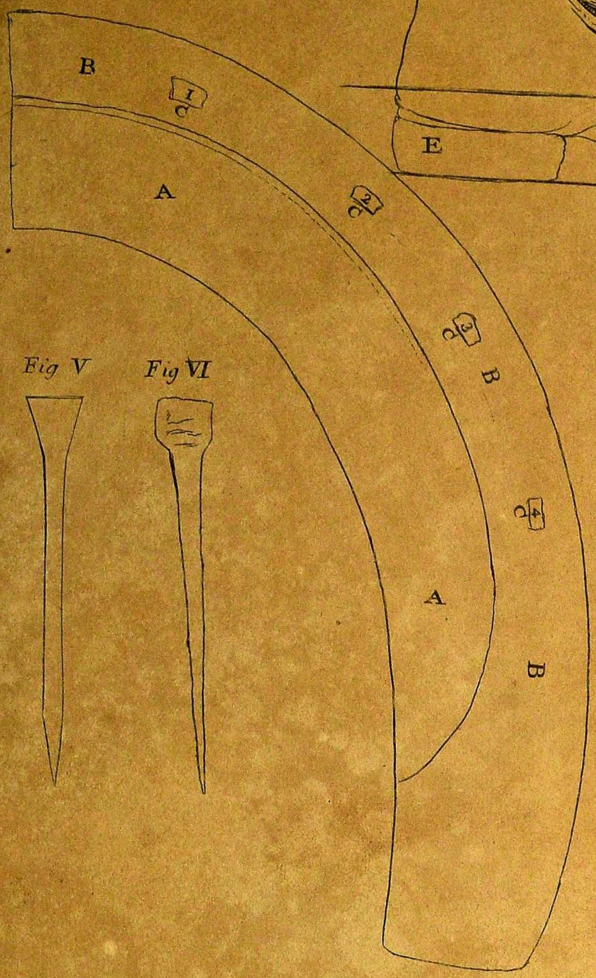

Fig III

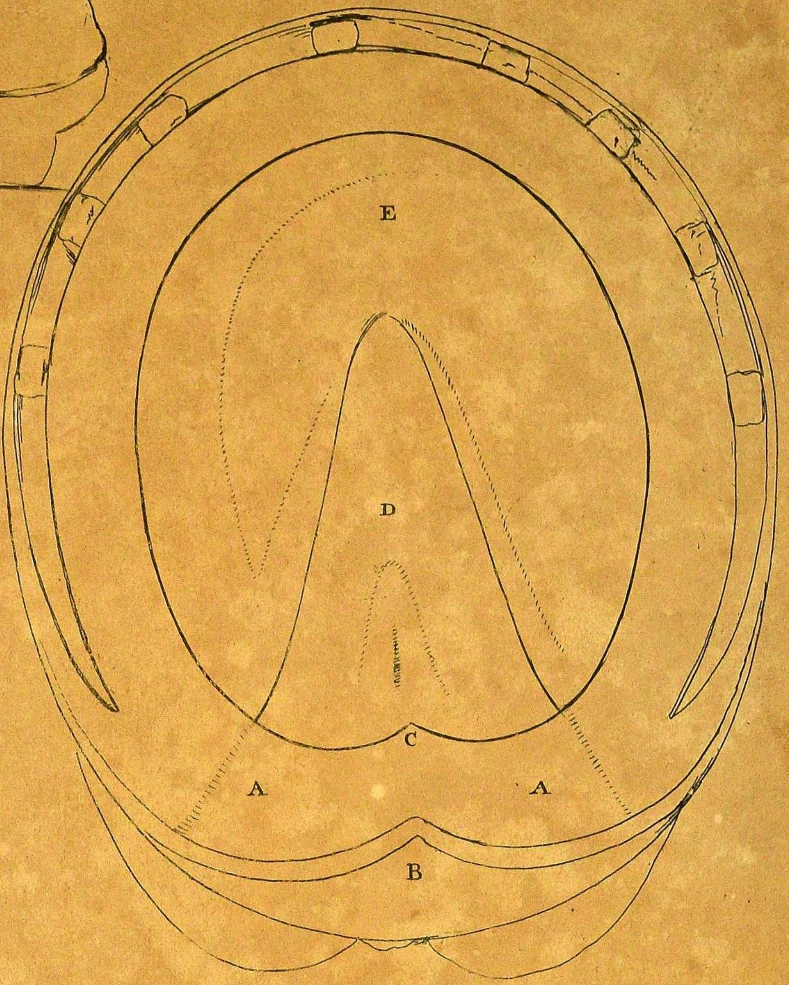

Fig V

Fig VI

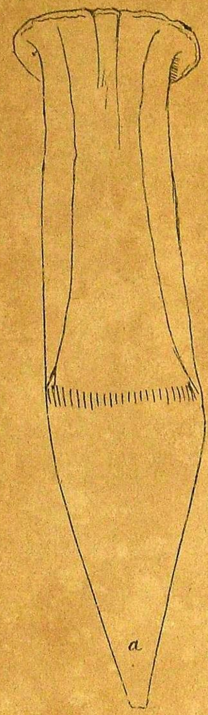

Fig IIII

FIGURE THE SECOND.

A view of the inner ſurface of a ſhoe, that has a flat ſeat for the cruſt, and the web concave for the ſole.

A A The concave part of the ſhoe, to be placed oppoſite the ſole.

B B B The flat ſeat of the ſhoe, intended to be in contact only with the cruſt, but made of the ſame breadth at the inſide and outſide quarters, as at the toe, and much broader at every part than the ſubſtance of cruſt of moſt hoofs; and conſequently this ſeat muſt be oppoſite the ſole in every caſe where the breadth of cruſt is leſs than the ſeat.

1 2 3 4 The nail holes in the quarters of the ſhoe.

C C C C The flat portion of the ſeat, that is frequently oppoſite, and preſſes on the edge of the ſole, at its junction with the cruſt.

FIGURE THE THIRD.

A hoof ſhod with a bar ſhoe.

A A The bar of the ſhoe reſting on the frog.

B The back part of the ſhoe turned up as a ſtop.

C The anterior part of the bar received into the fiſſure of the frog.

D The frog.

E The ſole.

FIGURE

FIGURE THE FOURTH.

A punch, with a wedge point, to make the nail holes.

A The part that enters the ſhoe.

FIGURE THE FIFTH.

A nail, with a wedge head of the ſame form as the point of the ſtamp.

FIGURE THE SIXTH.

A nail with a common head.

END OF THE FIRST VOLUME.